



INFORMAZIONI GENERALI GENERAL INFORMATION ALLGEMEINE INFORMATIONEN INFORMATIONS GENERALES

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Revisioni
L'indice di revisione del catalogo è riportato a pag. 190.
Al sito www.bonfiglioli.com sono disponibili i cataloghi con le revisioni aggiornate.

Revisions
Refer to page 190 for the catalogue revision index.
Visit www.bonfiglioli.com to search for catalogues with up-to-date revisions.

Änderungen
Das Revisionsverzeichnis des Katalogs wird auf Seite 190 wiedergegeben. Auf unserer Website www.bonfiglioli.com werden die Kataloge in ihrer letzten, überarbeiteten Version angeboten.

Révisions
Le sommaire de révision du catalogue est indiqué à la page 190.
Sur le site www.bonfiglioli.com des catalogues avec les dernières révisions sont disponibles.



1 - SIMBOLOGIA E UNITÀ DI MISURA

1 - SYMBOLS AND UNITS OF MEASURE

1 - VERWENDETE SYMBOLE UND EINHEITEN

1 - SYMBOLES ET UNITES DE MESURE

Simb. Symb.	U.m. Meße- inh.	Descrizione	Description	Beschreibung	Description
$A_{N\ 1, 2}$ [N]		Carico assiale nominale	Permissible axial force	Nenn-Axialbelastung	Charge axiale nominale
f_s	—	Fattore di servizio	Service factor	Betriebsfaktor	Facteur de service
f_T	—	Fattore termico	Thermal factor	Temperaturfaktor	Facteur thermique
f_{TP}	—	Fattore di temperatura	Temperature factor	Wärmefaktor	Facteur de température
i	—	Rapporto di trasmissione	Gear ratio	Übersetzung	Rapport de réduction
I	—	Rapporto di intermittenza	Cyclic duration factor	Relative Einschaltdauer	Rapport d'intermittence
J_C	[Kgm ²]	Momento di inerzia carico	Mass moment of inertia to be driven	Massenträgheitsmoment der externen Massen	Moment d'inertie de la charge
J_M	[Kgm ²]	Momento di inerzia motore	Motor mass moment of inertia	Motorträgheitsmoment	Moment d'inertie du moteur
J_R	[Kgm ²]	Momento di inerzia riduttore	Mass moment of inertia for the gear unit	Getriebeträgheitsmoment	Moment d'inertie du réducteur
K	—	Fattore di accelerazione delle masse	Mass acceleration factor	Massenbeschleunigungsfaktor	Facteur d'accélération des masses
K_r	—	Costante di trasmissione	Transmission element factor	Belastungsfaktor der Radiallast	Constante de transmission
$M_{1, 2}$ [Nm]		Coppia	Torque	Drehmoment	Couple
M_c 1, 2 [Nm]		Coppia di calcolo	Calculated torque	Berechnetes Drehmoment	Couple de calcul
M_n 1, 2 [Nm]		Coppia nominale	Rated torque	Nennmoment	Couple nominal
M_r 1, 2 [Nm]		Coppia richiesta	Torque demand	Benötigtes Drehmoment	Couple nécessaire
n 1, 2 [min ⁻¹]		Velocità	Speed	Abtriebsdrehzahl	Vitesse
P 1, 2 [kW]		Potenza	Power	Leistung	Puissance
P_N 1, 2 [kW]		Potenza nominale	Rated power	Nennleistung	Puissance nominale
P_R 1, 2 [kW]		Potenza richiesta	Power demand	Benötigte Leistung	Puissance nécessaire
R_C 1, 2 [N]		Carico radiale di calcolo	Calculated radial force	Berechnete Axialbelastung	Charge radiale de calcul
R_N 1, 2 [N]		Carico radiale nominale	Permissible overhung load	Zulässige Radialbelastung	Charge radiale nominale
S	—	Fattore di sicurezza	Safety factor	Sicherheitsfaktor	Facteur de sécurité
t_a	[°C]	Temperatura ambiente	Ambient temperature	Umgebungstemperatur	Température ambiante
t_f	[min]	Tempo di funzionamento a carico costante	Work time under constant load	Betriebszeit während nennbetrieb	Temps de fonctionnement à charge constante
t_r	[min]	Tempo di riposo	Rest time	Stillstandszeit	Temps de repos
η_d	—	Rendimento dinamico	Dynamic efficiency	Dynamischer Wirkungsgrad	Rendement dynamique
η_s	—	Rendimento statico	Static efficiency	Statischer Wirkungsgrad	Rendement statique

1 valore riferito all'albero veloce

1 value applies to input shaft

1 Werte beziehen sich auf die Antriebswelle

1 valeurs pour l'arbre rapide

2 valore riferito all'albero lento

2 value applies to output shaft

2 Werte beziehen sich auf die Abtriebswelle

2 valeurs pour l'arbre lent



Questo simbolo riporta i riferimenti angolari per l'indicazione della direzione del carico radiale (l'albero è visto di fronte).



This symbol refers to the angle the overhung load applies (viewing from drive end).



Dieses Symbol gibt die Winkelbezugswerte für die Angabe der Richtung der Radialkräfte an (Stirnansicht der Welle).



Ce symbole présente les références angulaires pour l'indication de la direction de la charge radiale (l'arbre est vu de face).



Simbolo riferito al peso dei riduttori e dei motoriduttori. I valori riportati nelle tabelle dei motoriduttori sono comprensivi sia del peso del motore a 4 poli sia del peso del lubrificante contenuto, qualora previsto da BONFIGLIOLI RIDUTTORI.



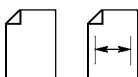
Symbol refers to weight of gearmotors and speed reducers. Figure for gearmotors incorporates the weight of the 4-pole motor and for life lubricated units, where applicable, the weight of the oil.



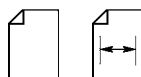
Symbol für das Gewicht der Getriebe und der Getriebemotoren. Die in der Getriebemotoren-Tabelle genannten Werte schließen das Gewicht des vierpoligen Motors und die eingefüllte Schmierstoffmenge ein, sofern von BONFIGLIOLI RIDUTTORI vorgesehen.



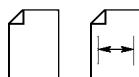
Symbole se référant aux poids des réducteurs et des motoréducteurs. Les valeurs indiquées dans les tableaux des motoréducteurs comprennent tant le poids du moteur à 4 pôles que le poids du lubrifiant contenu, lorsque prévu par BONFIGLIOLI RIDUTTORI.



Il simbolo identifica la pagina alla quale può essere reperita l'informazione.



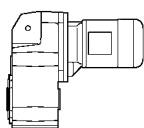
The symbol shows the page the information can be sorted from.



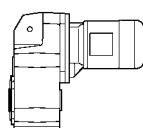
Das Symbol Kennzeichnet die Seite, auf die die Information gefunden werden kann.



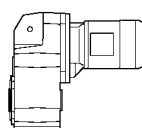
Le symbole identifie la page à laquelle l'on peut trouver l'information.



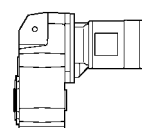
Motoriduttore con motore integrato.



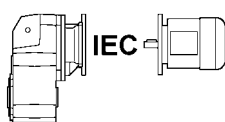
Gearmotor with compact motor.



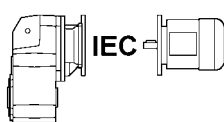
Getriebemotor mit Kompaktmotor.



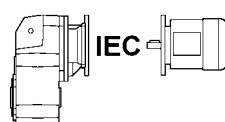
Motoréducteur avec moteur compact.



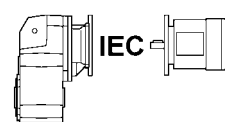
Motoriduttore abbinato con motore a standard IEC.



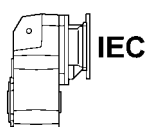
Gearmotor with IEC motor.



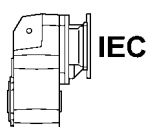
Getriebemotor mit IEC-Motor.



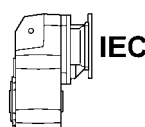
Motoréducteur avec moteur normalisé CEI.



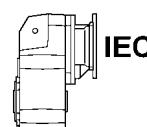
Riduttore predisposto per abbinamento con motore a standard IEC.



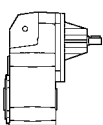
Gear unit with IEC motor interface.



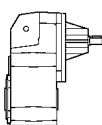
Getriebe vorbereitet für IEC-motor.



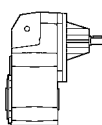
Réducteur prédisposé pour liaison a moteur IEC.



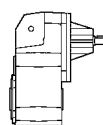
Riduttore dotato di albero veloce cilindrico.



Speed reducer with solid input shaft.



Getriebe mit cylindrischer Antriebswelle.



Réducteur avec arbre rapide Cyllindrique.



INFORMAZIONI GENERALI	GENERAL INFORMATION	ALLGEMEINEINFORMATIONEN	INFORMATIONS GENERALES
2 - COPPIA	2 - TORQUE	2 - ABTRIEBSMOMENT	2 - COUPLE
Coppia nominale M_{n2} [Nm] È la coppia trasmissibile in uscita con carico continuo uniforme, riferita alla velocità in ingresso n_1 e a quella corrispondente in uscita n_2. È calcolata in base ad un fattore di servizio $f_s = 1$.	Rated torque M_{n2} [Nm] <i>The torque that can be transmitted continuously through the output shaft, with the gear unit operated under a service factor $f_s = 1$. Rating is speed sensitive.</i>	Nenn-Drehmoment M_{n2} [Nm] Dies ist das an der Abtriebswelle übertragbare Drehmoment bei gleichförmiger Dauerbelastung bezogen auf die Antriebsdrehzahl n_1 und die entsprechende Abtriebsdrehzahl n_2. Das Drehmoment wird auf Grundlage eines Betriebsfaktor $f_s = 1$ berechnet.	Couple nominal M_{n2} [Nm] <i>C'est le couple transmissible en sortie avec une charge continue uniforme se référant à la vitesse en entrée n_1 et à celle correspondante en sortie n_2. Il est calculé sur la base d'un facteur de service $f_s = 1$.</i>
Coppia richiesta M_{r2} [Nm] Rappresenta la coppia richiesta dall'applicazione e dovrà sempre essere uguale o inferiore alla coppia in uscita nominale M_{n2} del riduttore scelto.	Required torque M_{r2} [Nm] <i>The torque demand based on application requirement. It must always be equal to or less than torque M_{n2} the gearbox under study is rated for.</i>	Verlangtes Drehmoment M_{r2} [Nm] Dies ist das von der Anwendung verlangte Drehmoment, das stets kleiner oder gleich dem Nenn-Abtriebsmoment M_{n2} des gewählten Getriebes sein muß.	Couple requis M_{r2} [Nm] <i>Il représente le couple requis par l'application et devra toujours être inférieur ou égal au couple en sortie nominal M_{n2} du réducteur choisi.</i>
Coppia di calcolo M_{c2} [Nm] È il valore di coppia da utilizzare per la selezione del riduttore considerando la coppia richiesta M_{r2} e il fattore di servizio f_s ed è dato dalla formula:	Calculated torque M_{c2} [Nm] <i>Computational torque value to be used when selecting the gearbox. It is calculated considering the required torque M_{r2} and service factor f_s, as per the equation here after:</i>	Soll-Drehmoment M_{c2} [Nm] Dies ist das bei der Wahl des Getriebes zugrundezulegende Drehmoment, wobei das übertragene Drehmoment M_{r2} und der Betriebsfaktor f_s zu berücksichtigen sind; das Soll-Drehmoment wird mit folgender Gleichung berechnet:	Couple de calcul M_{c2} [Nm] <i>C'est la valeur de couple à utiliser pour la sélection du réducteur en considérant le couple requis M_{r2} et le facteur de service f_s et s'obtient avec la formule:</i>
$M_{c2} = M_{r2} \cdot f_s < M_{n2} \quad (1)$			
3 - POTENZA	3 - POWER	3 - LEISTUNG	3 - PUISSANCE
Potenza nominale in entrata P_{n1} [kW] Nelle tabelle di selezione dei riduttori è la potenza applicabile in entrata riferita alla velocità n_1, considerando un fattore di servizio $f_s = 1$.	Rated power P_{n1} [kW] <i>In the gearbox selection charts this is the power applicable to input shaft, based on input speed n_1 and corresponding to service factor $f_s = 1$.</i>	Leistung Antriebswelle P_{n1} [kW] In den Tabellen für die Wahl der Getriebe ist die an der Antriebswelle übertragbare Leistung auf die Drehzahl n_1 bezogen und es wurde ein Betriebsfaktor $f_s = 1$ angenommen.	Puissance en entrée P_{n1} [kW] <i>Dans les tableaux de sélection des réducteurs, c'est la puissance applicable en entrée se rapportant à la vitesse n_1 et en considérant un facteur de service $f_s = 1$.</i>



4 - POTENZA TERMICA P_t [kW]

P_t è il valore che indica il limite termico del riduttore e rappresenta la potenza trasmissibile in servizio continuo, e alla temperatura ambiente $t_a = 20^\circ\text{C}$, senza che si producano danneggiamenti negli organi del riduttore o degradamenti del lubrificante. Vedi tab. (A1).

Nel caso di servizio intermittente, o di temperatura ambiente diversa da 20°C , il valore di P_t deve essere corretto per mezzo del fattore f_t , espresso dalla tabella (A2), ossia $P_t' = P_t \times f_t$.

Infine, per riduttori con più di due riduzioni e/o con rapporto $i > 45$ la verifica della potenza termica non è necessaria in quanto quest'ultima è certamente superiore alla potenza meccanica trasmissibile.

4 - THERMAL CAPACITY P_t [kW]

P_t is the power that can be transmitted through the gear unit, under a continuous duty and an ambient temperature of 20°C , without resulting into damage of the inner parts or degradation of the lubricant properties. Refer to chart (A1) for specific kW ratings.

In case of intermittent duty, or an operating ambient temperature other than the rated 20°C , the P_t value should be adjusted through the factor f_t , obtained from chart (A2), as per the following equation: $P_t' = P_t \times f_t$.

Gear units featuring more than 2 reductions and/or a gear ratio greater than $i = 45$ do not normally require the thermal limit to be checked as in these cases the thermal rating usually exceeds the mechanical rating.

4 - THERMISCHE GRENZ- LEISTUNG P_t [kW]

P_t steht für den Wert der Wärmegrenzleistung des Getriebes und gibt die im Dauerbetrieb und bei einer Umgebungstemperatur $t_a = 20^\circ\text{C}$ übertragbare Leistung an, ohne daß sich daraus Schäden an den Getriebeorganen oder ein Verfall des Schmiermittels ergeben. Siehe Tab. (A1). Bei einem Aussetzbetrieb oder bei verschiedener Umgebungstemperatur als 20°C muß der Wert P_t über den Faktor f_t korrigiert werden, der in der Tabelle (A2) aufgeführt wird bzw. $P_t' = P_t \times f_t$.

Bei Getrieben mit mehr als zwei Untersetzungsstufen und/oder einem Verhältnis von $i > 45$ ist die Kontrolle der thermischen Leistung nicht erforderlich, da sie sicher oben der mechanisch übertragbaren Leistung liegt.

4 - PUISSANCE THERMIQUE P_t [kW]

P_t est la valeur qui indique la limite thermique du réducteur et représente la puissance transmissible en service continu, et à une température ambiante $t_a = 20^\circ\text{C}$, sans apparition de dommages au niveau des organes du réducteur ou de dégradations du lubrifiant. Voir tab. (A1). En cas de service intermittent ou de température ambiante différente de 20°C , la valeur de P_t doit être corrigée au moyen du facteur f_t , exprimé dans le tableau (A2), à savoir: $P_t' = P_t \times f_t$.

Enfin, pour les réducteurs ayant plus de deux réductions et/ou un rapport $i > 45$, la vérification de la puissance thermique n'est pas nécessaire car elle est certainement supérieure à la puissance mécanique transmissible.

(A1)

P_t [kW] 20°C		
	$n_1 = 1400 \text{ min}^{-1}$	$n_1 = 2800 \text{ min}^{-1}$
F 10 2	3.8	2.7
F 20 2	9.1	6.5
F 30 2	11.7	8.5
F 40 2	14.3	10.4
F 50 2	21.5	15.0
F 60 3	26.0	18.9
F 70 3	36.4	26.0
F 80 3	52	36
F 90 3	75	53

(A2)

f_t					
t_a [$^\circ\text{C}$]	Servizio continuo Continuous duty Dauerbetrieb Service continu	Servizio intermittente / Intermittent duty / Aussetzbetrieb / Service intermittent			
		Grado di intermittenza / Degree of intermittence / Relative Einschaltdauer / Degré d'intermittence			
		[1]			
		80%	60%	40%	20%
40	0.80	1.1	1.3	1.5	1.6
30	0.85	1.3	1.5	1.6	1.8
20	1.0	1.5	1.6	1.8	2.0
10	1.15	1.6	1.8	2.0	2.3



Il grado di intermittenza (I)% è dato dal rapporto fra il tempo di funzionamento a carico t_f e il tempo totale ($t_f + t_r$), espresso in percentuale.

Where cyclic duration factor (I)% is the relationship of operating time under load t_f to total time ($t_f + t_r$) expressed as a percentage.

Wobei die Einschaltdauer (I)% von dem Verhältnis zwischen Betriebszeit unter Last t_f und der Gesamtbetriebszeit ($t_f + t_r$), ausgedrückt in Prozenten, gegeben wird.

Où le degré d'intermittence (I)% est fourni par le rapport entre le temps de fonction en charge et le temps total ($t_f + t_r$) exprimé en pourcentage.

$$I = \frac{t_f}{t_f + t_r} \cdot 100 \quad (2)$$

La condizione da verificare è:

The condition to be verified is:

Die durchzuführende Kontrolle ist:

La vérification à faire sera la suivante:

$$P_{r1} \leq P_t \times f_t \quad (3)$$

5 - RENDIMENTO

5 - EFFICIENCY

5 - WIRKUNGSGRAD

5 - RENDEMENT

Rendimento dinamico η_d

Dynamic efficiency η_d

Dynamischer Wirkungsgrad η_d

Rendement dynamique η_d

È dato dal rapporto fra la potenza in uscita P_2 e quella in entrata P_1 secondo la relazione:

Obtained from the relationship of delivered power P_2 to input power P_1 , according to the following equation:

Er ist gegeben durch das Verhältnis der Abtriebsleistung P_2 zur Antriebsleistung P_1 :

Il est donné par le rapport entre la puissance en sortie P_2 et celle en entrée P_1 :

$$\eta_d = \frac{P_2}{P_1} \cdot 100 \quad [\%] \quad (4)$$

(A3)

	2 x 	3 x 	4 x 
η_d	95%	93%	90%

6 - RAPPORTO DI RIDUZIONE i

6 - GEAR RATIO i

6 - GETRIEBEÜBERSETZUNG i

6 - RAPPORT DE REDUCTION i

Il valore del rapporto di riduzione della velocità, identificato con il simbolo $[i]$, è espresso tramite il rapporto fra le velocità all'albero veloce e lento del riduttore e riassunto nell'espressione:

The value for the gear ratio is referred to with the letter $[i]$ and calculated through the relationship of the input speed n_1 to the output speed n_2 :

Die Übersetzung des Getriebes wird mit dem Buchstaben $[i]$ bezeichnet und ist folgendermaßen definiert:

Le rapport de réduction est identifiée par la lettre $[i]$ et son calcul s'effectue à partir de la vitesse d'entrée n_1 et de la vitesse de sortie n_2 en utilisant la relation suivante :

$$i = \frac{n_1}{n_2} \quad (5)$$



Il rapporto di riduzione è solitamente un numero decimale che viene rappresentato nel catalogo con una sola cifra decimale, o nessuna nel caso di $i > 1000$.

Se si è interessati a conoscere il numero in tutte le componenti decimali consultare il Servizio Tecnico di Bonfiglioli Riduttori.

The gear ratio is usually a decimal number which in this catalogue is truncated at one digit after the comma (no decimals for $i > 1000$).

If interested in knowing the exact value please consult Bonfiglioli's Technical Service.

In diesem Katalog wird die Übersetzung mit einer Stelle hinter dem Komma angegeben, bei Übersetzungen > 1000 ohne Dezimalstelle.

Wenn genaue Angaben zur Übersetzung benötigt werden, wenden sie sich bitte an den technischen Service von Bonfiglioli Riduttori.

Dans le catalogue, le rapport de réduction a une précision d'un chiffre après la virgule (sauf pour $i > 1000$).

Si une plus grande précision est nécessaire, contacter le Service Technique de Bonfiglioli.

7 - VELOCITÀ ANGOLARE

Velocità in entrata
 n_1 [min^{-1}]

È la velocità relativa al tipo di motorizzazione scelta; i valori di catalogo si riferiscono alle velocità dei motori elettrici comunemente usati a singola e doppia polarità.

Se il riduttore riceve il moto da una trasmissione in entrata, è sempre preferibile adottare velocità inferiori a 1400 min^{-1} al fine di garantire condizioni ottimali di funzionamento.

Velocità in entrata superiori sono ammesse considerando il naturale declassamento della coppia nominale M_{n2} del riduttore.

7 - ANGULAR VELOCITY

Input speed
 n_1 [min^{-1}]

The speed is related to the prime mover selected. Catalogue values refer to speed of either single or double speed motors that are common in the industry.

If the gearbox is driven by an external transmission it is recommended to operate it with a speed of 1400 min^{-1} , or lower, in order to optimise operating conditions and lifetime.

Higher input speeds are permitted, however in this case consider that torque rating M_{n2} is affected adversely.

Please consult a Bonfiglioli representative.

7 - DREHZAHL

Drehzahl Antriebswelle
 n_1 [min^{-1}]

Dies ist die vom gewählten Motortyp abhängige Drehzahl. Die Katalogangaben beziehen sich auf die Drehzahl von allgemein üblichen eintourigen Elektromotoren oder von polumschaltbaren Elektromotoren.

Um optimale Betriebsbedingungen zu gewährleisten, ist stets eine Antriebsdrehzahl unter 1400 min^{-1} zu empfehlen.

Höhere Antriebsdrehzahlen sind zulässig, wobei die zwangsläufige Herabsetzung des Nenn-Abtriebsdrehmoments M_{n2} des Getriebes zu berücksichtigen ist.

7 - VITESSE ANGULAIRE

Vitesse d'entrée
 n_1 [min^{-1}]

C'est la vitesse relative au type de motorisation choisie. Les valeurs de catalogue se réfèrent aux vitesses des moteurs électriques à simple et double polarité communément utilisés.

Si le réducteur reçoit le mouvement d'une transmission en entrée, il est toujours préférable d'adopter des vitesses inférieures à 1400 min^{-1} afin de garantir des conditions optimales de fonctionnement.

Des vitesses d'entrée supérieures sont admises en considérant le déclassement naturel du couple nominal M_{n2} du réducteur.

Velocità in uscita
 n_2 [min^{-1}]

È in funzione della velocità in entrata n_1 e del rapporto di riduzione i secondo la relazione:

Output speed
 n_2 [min^{-1}]

The output speed value n_2 is calculated from the relationship of input speed n_1 to the gear ratio i , as per the following equation:

Abtriebsdrehzahl
 n_2 [min^{-1}]

Sie ist abhängig von der Antriebsdrehzahl n_1 und dem Übersetzungs i nach folgender Gleichung:

Vitesse en sortie
 n_2 [min^{-1}]

Elle varie en fonction de la vitesse d'entrée n_1 et du rapport de réduction i selon l'équation:

$$n_2 = \frac{n_1}{i}$$

(6)

8 - MOMENTO D'INERZIA
 J_r [Kgm^2]

I momenti d'inerzia indicati a catalogo sono riferiti all'asse di entrata del riduttore per cui, nel caso di accoppiamento diretto, sono già rapportati alla velocità del motore.

8 - MOMENT OF INERTIA
 J_r [Kgm^2]

Moments of inertia specified in the catalogue refer to the gear unit input axis. They are therefore related to motor speed, in the case of direct motor mounting.

8 - TRÄGHEITSMOMENT
 J_r [Kgm^2]

Die im Katalog angegebenen Trägheitsmomente sind auf die Antriebswelle des Getriebes bezogen und daher im Falle einer direkten Verbindung schon zur Motordrehzahl in Beziehung gesetzt.

8 - MOMENT D'INERTIE
 J_r [Kgm^2]

Les moments d'inertie indiqués dans le catalogue se réfèrent à l'axe d'entrée du réducteur par conséquent, dans le cas d'accouplement direct, ils se rapportent déjà à la vitesse du moteur.



9 - FATTORE DI SERVIZIO f_s

Il fattore di servizio è il parametro che traduce in un valore numerico la gravosità del servizio che il riduttore è chiamato a svolgere, tenendo conto, benché con inevitabile approssimazione, del funzionamento giornaliero, della variabilità del carico e di eventuali sovraccarichi, connessi con la specifica applicazione del riduttore.

Nel grafico (A4) più sotto riportato il fattore di servizio si ricava, dopo aver selezionato la colonna relativa alle ore di funzionamento giornaliere, per intersezione fra il numero di avviamenti orari e una fra le curve K1, K2 e K3.

Le curve K_ sono associate alla natura del servizio (approssimativamente: uniforme, medio e pesante) tramite il fattore di accelerazione delle masse K, legato al rapporto fra le inerzie delle masse condotte e del motore.

Indipendentemente dal valore così ricavato del fattore di servizio, segnaliamo che esistono applicazioni fra le quali, a puro titolo di esempio i sollevamenti, per le quali il cedimento di un organo del riduttore potrebbe esporre il personale che opera nelle immediate vicinanze a rischio di ferimento.

Se esistono dubbi che l'applicazione possa presentare questa criticità vi invitiamo a consultare preventivamente il ns. Servizio Tecnico.

9 - SERVICE FACTOR f_s

This factor is the numeric value describing reducer service duty. It takes into consideration, with unavoidable approximation, daily operating conditions, load variations and overloads connected with reducer application.

In the graph (A4) below, after selecting proper "daily working hours" column, the service factor is given by intersecting the number of starts per hour and one of the K1, K2 or K3 curves.

K_ curves are linked with the service nature (approximately: uniform, medium and heavy) through the acceleration factor of masses K, connected to the ratio between driven masses and motor inertia values.

Regardless of the value given for the service factor, we would like to remind that in some applications, which for example involve lifting of parts, failure of the reducer may expose the operators to the risk of injuries.

If in doubt, please contact our Technical Service Department.

9 - BETRIEBSFAKTOR f_s

Beim Betriebsfaktor handelt es sich um den Parameter, der die Betriebsbelastung, die das Getriebe aushalten muss, in einem Wert ausdrückt. Dabei berücksichtigt er, auch wenn nur mit einer unvermeidbaren Annäherung, den täglichen Einsatz, die unterschiedlichen Belastungen und eventuelle Überbelastungen, die mit der spezifischen Applikation des Getriebes verbunden sind. Der nachstehenden Grafik (A4) kann, nach der Wahl der entsprechenden Spalte mit der Angabe der täglichen Betriebsstunden der Betriebsfaktor entnommen werden, indem man die Schnittstelle zwischen der stündlichen Schaltungen und einer der Kurven K1, K2 und K3 sucht. Die mit K_ gekennzeichneten Kurven sind über den Beschleunigungsfaktor der Massen K an die Betriebsart gekoppelt (annähernd: gleichmäßige, mittlere oder starke Belastung), der wiederum an das Verhältnis zwischen Trägheitsmoment der angetriebenen Massen und dem des Motors gebunden ist. Unabhängig von dem so erhaltenen Betriebsfaktor, möchten wir Sie darauf hinweisen, dass es Applikationen gibt, unter denen beispielsweise auch die Hebefunktionen zu finden sind, bei denen das Nachgeben eines Getriebeorgans, das in dessen Nähe arbeitende Personal einer Verletzungsgefahr aussetzen könnte. Sollten daher Zweifel darüber bestehen, ob die entsprechende Applikation sich in diesem Bezug als kritisch erweist, bitten wir Sie sich zuvor mit unseren Technischen Kundendienst in Verbindung zu setzen.

9 - FACTEUR DE SERVICE f_s

Le facteur de service est le paramètre qui traduit en une valeur numérique la difficulté du service que le réducteur est appelé à effectuer en tenant compte, avec une approximation inévitable, du fonctionnement journalier, de la variabilité de la charge et des éventuelles surcharges liées à l'application spécifique du réducteur.

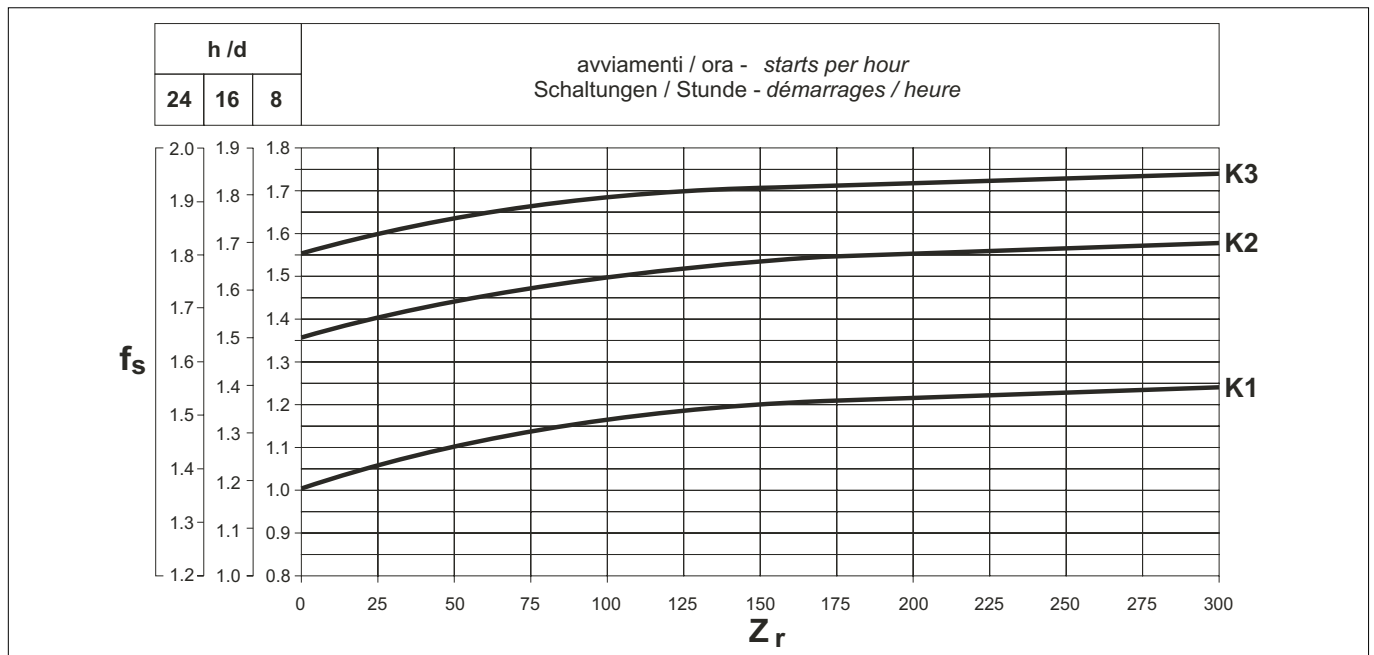
Sur le graphique (A4) ci-dessous, le facteur de service peut être trouvé, après avoir sélectionné la colonne relative aux heures de fonctionnement journalier, à l'intersection entre le nombre de démarrages horaires et l'une des courbes K1, K2 et K3.

Les courbes K_ sont associées à la nature du service (approximativement : uniforme, moyen et difficile) au moyen du facteur d'accélération des masses K, lié au rapport entre les inerties des masses conduites et le moteur.

Indépendamment de la valeur du facteur de service ainsi trouvée, nous signalons qu'il existe des applications parmi lesquelles, à titre d'exemple, les levages, pour lesquels la rupture d'un organe du réducteur pourrait exposer le personnel opérant à proximité immédiate à des risques de lésion.

En cas de doute concernant les risques éventuels de l'application, nous vous conseillons de contacter préalablement notre Service Technique.

(A4)





Fattore di accelerazione delle masse, K	Acceleration factor of masses, K	Beschleunigungsfaktor der Massen, K	Facteur d'accélération des masses, K
Il parametro serve a selezionare la curva relativa al particolare tipo di carico. Il valore è dato dal rapporto:	<i>This parameter serves for selecting the right curve for the type of load. The value is given by the following ratio:</i>	Dieser Parameter dient der Wahl der Kurve, die sich auf die jeweilige Belastungsart bezieht. Der Wert ergibt sich aus folgender Formel:	<i>Le paramètre sert à sélectionner la courbe relative au type de charge particulier. La valeur est obtenue par l'équation :</i>
$K = \frac{J_c}{J_m} \quad (7)$			
dove:	where:	wobei:	où:
J_c momento d'inerzia delle masse comandate, riferito all'albero del motore	J_c moment of inertia of driven masses referred to motor driving shaft	J_c Trägheitsmoment der angetriebenen Massen, bezogen auf die Motorwelle	J_c moment d'inertie des masses commandées se référant à l'arbre du moteur
J_m momento d'inerzia del motore	J_m moment of inertia of motor	J_m Trägheitsmoment des Motors	J_m moment d'inertie du moteur
$K \leq 0.25$ – curva K1 carico uniforme	$K \leq 0.25$ – curve K1 uniform load	$K \leq 0.25$ – Kurve K1 Gleichmäßige Belastung	$K \leq 0.25$ – courbe K1 charge uniforme
$0.25 < K \leq 3$ – curva K2 carico con urti moderati	$0.25 < K \leq 3$ – curve K2 moderate shock load	$0.25 < K \leq 3$ – Kurve K2 Belastung mit mäßigen Stößen	$0.25 < K \leq 3$ – courbe K2 charge avec chocs modérés
$3 < K \leq 10$ – curva K3 carico con forti urti	$3 < K \leq 10$ – curve K3 heavy shock load	$3 < K \leq 10$ – Kurve K3 Belastung mit starken Stößen	$3 < K \leq 10$ – courbe K3 charge avec chocs importants
Per valori di K > 10 invitiamo a consultare il nostro Servizio Tecnico.	For K values > 10, please contact our Technical Service.	Bei Werten K > 10 bitten wir Sie, sich mit unseren Technischen Kundendienst in Verbindung zu setzen.	Pour des valeurs de K > 10, nous vous conseillons de contacter notre Service Technique.

10 - MANUTENZIONE

I riduttori forniti con lubrificazione permanente non necessitano di sostituzioni periodiche dell'olio.
Per gli altri si consiglia di effettuare una prima sostituzione del lubrificante dopo circa 300 ore di funzionamento provvedendo ad un accurato lavaggio interno del gruppo con adeguate detergenti.
Evitare di miscelare olii a base minerale con olii sintetici.
Controllare periodicamente il livello del lubrificante effettuando la sostituzione indicativamente agli intervalli riportati nella tabella (A5).

10 - MAINTENANCE

Life lubricated gearboxes do not require any periodical oil changes.
For other types of gearboxes, the first oil change must take place after about 300 hours of operation, carefully flushing the gear unit using suitable detergents.
Do not mix mineral oils with synthetic oils.
Check oil level regularly and change oil at the intervals shown in the table (A5).

10 - WARTUNG

Die mit Dauerschmierung gelieferten Getriebe bedürfen periodische Ölwechsel.
Bei den übrigen Getrieben wird ein erster Ölwechsel nach ca. 300 Betriebsstunden empfohlen, wobei das Innere der Gruppe sorgfältig mit einem geeigneten Reinigungsmittel zu waschen ist.
Mineralöle nicht mit Synthesenölen mischen.
Den Ölstand regelmäßig kontrollieren. Die Ölwechsel in den in der Tabelle (A5) angegebenen Fristen durchführen.

10 - ENTRETIEN

Les réducteurs fournis avec lubrification permanente n'ont besoin d'aucun remplacement périodique de huile.
Pour les autres, nous conseillons d'effectuer une première vidange du lubrifiant après les 300 premières heures de fonctionnement en réalisant un lavage soigné à l'intérieur du groupe avec des produits détergents appropriés. Éviter de mélanger les huiles à base minérale avec des huiles synthétiques. Contrôler périodiquement le niveau du lubrifiant en effectuant les vidanges conformément aux intervalles indiqués dans le tableau (A5).

(A5)

Temperatura olio / Oil temperature Öltemperatur / Température huile [°C]	Intervallo di lubrificazione / Oil change interval Schmierfrist / Intervalle de lubrification [h]	
	olio minerale / mineral oil Mineralöl / huile minérale	olio sintetico / synthetic oil Syntheseöl / huile synthétique
< 65	8000	25000
65 - 80	4000	15000
80 - 95	2000	12500



11 - SELEZIONE

Per selezionare correttamente un riduttore o un motoriduttore, è necessario disporre di alcuni dati fondamentali che sono sintetizzati nella tabella (A6). In particolare, essa potrà essere compilata ed inviata in copia al ns. Servizio Tecnico che provvederà alla ricerca della motorizzazione più idonea alla applicazione indicata.

11 - SELECTION

Some fundamental data are necessary to assist the correct selection of a gearbox or gearmotor. The table below (A6) briefly sums up this information.

To simplify selection, fill in the table and send a copy to our Technical Service which will select the most suitable drive unit for your application.

11 - ANTRIEBSAUSWAHL

Um die Getriebe und Getriebe-motoren richtig auszuwählen zu können, muß man über einige grundlegende Daten verfügen, die wir in der Tabelle (A6) zusammengefaßt haben.

Eine Kopie dieser vom Kunden ausgefüllten Tabelle kann an unseren Technischen Kundendienst geschickt werden, der dann die für die gewünschte Anwendung geeignete Auslegung wählt.

11 - SELECTION

Pour sélectionner correctement un réducteur ou un motoréducteur, il est nécessaire de disposer de certaines données fondamentales que nous avons résumé dans le tableau (A6).

En particulier, ce dernier pourra être rempli et retourné à notre service technique qui recherchera la motorisation la plus appropriée à l'application indiquée.

(A6)

Tipo di applicazione <i>Type of application</i> Anwendung <i>Type d'application</i>		
P ₂ Potenza in uscita a n ₂ max <i>Output power at n₂ max</i> Abtriebsleistung bei n ₂ max <i>Puissance en sortie à n₂ maxi</i>	kW	Senso di rotazione albero entrata (O-AO) (**) <i>Input shaft rotation direction (CW-CCW) (**) Drehrichtung der Antriebswelle (U-GU) (**) Sens de rotation arbre entrée (H-AH) (**) A_{c2}</i>
P ₂ ' Potenza in uscita a n ₂ min <i>Output power at n₂ min</i> Abtriebsleistung bei n ₂ min <i>Puissance en sortie à n₂ mini</i>	kW	A _{c1} Carico assiale su albero in uscita (+/-)(***) <i>Thrust load on output shaft (+/-)(***) Axialkraft auf Abtriebswelle (+/-)(***) Charge axiale sur arbre de sortie (+/-)(***) N</i>
M ₂ Momento torcente in uscita a n ₂ max <i>Output torque at n₂ max</i> Abtriebsdrehmoment bei n ₂ max <i>Moment de torsion en sortie à n₂ maxi</i>	Nm	A _{c1} Carico assiale su albero in entrata (+/-)(***) <i>Thrust load on input shaft (+/-)(***) Axialkraft auf Antriebswelle (+/-)(***) Charge axiale sur arbre d'entrée (+/-)(***) N</i>
n ₂ Velocità di rotazione in uscita max <i>Max.output speed</i> Abtriebsdrehzahl max <i>Vitesse de rotation maxi en sortie</i>	min ⁻¹	J _c Momento d'inerzia del carico <i>Moment of inertia of the load</i> Trägheitsmoment der Last <i>Moment d'inertie de la charge Kgm²</i>
n ₂ ' Velocità di rotazione in uscita min <i>Min.output speed</i> Abtriebsdrehzahl min <i>Vitesse de rotation mini en sortie</i>	min ⁻¹	t _a Temperatura ambiente <i>Ambient temperature</i> Umgebungstemperatur <i>Température ambiante C°</i>
n ₁ Velocità di rotazione in entrata max <i>Max.input speed</i> Antriebsdrehzahl max <i>Vitesse de rotation maxi en entrée</i>	min ⁻¹	Altitudine sul livello del mare <i>Altitude above sea level</i> Höhe ü.d.M. <i>Altitude au-dessus du niveau de la mer m</i>
n ₁ ' Velocità di rotazione in entrata min <i>Min.input speed</i> Antriebsdrehzahl min <i>Vitesse de rotation mini en entrée</i>	min ⁻¹	Tipo di servizio in accordo a CEI <i>Duty type to IEC norms</i> Relative Einschaltdauer gemäß CEI <i>Type de service selon CE S...../.....%</i>
R _{c2} Carico radiale su albero in uscita <i>Radial load on output shaft</i> Radialkraft auf Abtriebswelle <i>Charge radiale sur arbre de sortie N</i>	N	Z Frequenza di avviamento <i>Starting frequency</i> Schaltungshäufigkeit <i>Fréquence de démarrage 1/h</i>
x ₂ Distanza di applicazione del carico (*) <i>Load application distance (*)</i> Abstand des Kraftangriffspunktes (*) <i>Distance d'application de la charge (*)</i>	mm	Tensione di alimentazione motore <i>Motor voltage</i> Nennspannung des Motors <i>Tension de alimentation moteur V</i>
Orientamento del carico in uscita <i>Load orientation at output</i> Orientierung der Last am Abtrieb <i>Orientation de la charge en sortie</i>		Tensione di alimentazione freno <i>Brake voltage</i> Nennspannung der Bremse <i>Tension de alimentation frein V</i>
Senso di rotazione albero uscita (O-AO) (**) <i>Output shaft rotation direction (CW-CCW) (**) Drehrichtung der Abtriebswelle (U-GU) (**) Sens de rotation arbre sortie (H-AH) (**)</i>		Frequenza <i>Frequency</i> Frequenz <i>Fréquence Hz</i>
R _{c1} Carico radiale su albero in entrata <i>Radial load on input shaft</i> Radialkraft auf Antriebswelle <i>Charge radiale sur arbre d'entrée N</i>	N	M _b Coppia frenante <i>Brake torque</i> Bremsmoment <i>Couple de freinag Nm</i>
x ₁ Distanza di applicazione del carico (*) <i>Load application distance (*)</i> Abstand des Kraftangriffspunktes (*) <i>Distance d'application de la charge (*)</i>	mm	Grado di protezione motore <i>Motor protection degree</i> Schutzart des Motors <i>Degré de protection moteur IP.....</i>
Orientamento del carico in entrata <i>Load orientation at input</i> Orientierung der Last am Antrieb <i>Orientation de la charge en entrée</i>		Classe di isolamento <i>Insulation class</i> Isolierstoffklasse <i>Classe d'isolation</i>

(*) La distanza x₁₋₂ è quella compresa fra il punto di applicazione della forza e la battuta dell'albero (se non indicata, si considererà la forza agente sulla mezzieria della sporgenza dell'albero).

(**) O = orario
AO = antiorario
(***) + = compressione
- = trazione

(*) Distance x₁₋₂ is between force application point and shaft shoulder (if not indicated the force acting at mid-point of the shaft extension will be considered).

(**) CW = clockwise;
CCW = counterclockwise
(***) + = push
- = pull

(*) Der Abstand x₁₋₂ ist der Abstand vom Kraftangriffspunkt zum Wellenansatz (wenn nicht anders angegeben, wird davon ausgegangen, daß die Kraft auf der Mitte des Wellenendes angreift).

(**) U = Uhrzeigersinn;
GU = Gegenuhrzeigersinn
(***) + = Druck
- = Zug

(*) La distance x₁₋₂ est celle comprise entre le point d'application de la force et l'épaulement de l'arbre (si non précisée l'on considèrera la force agissant au milieu de la saillie de l'arbre).

(**) H = sens horaire;
AH = sens antihoraire
(***) + = compression
- = traction



Scelta dei motoriduttori	Selection of a gearmotor	Wahl des Getriebemotors	Sélection des motoréducteurs
a) Determinare il fattore di servizio f_s in funzione del tipo di carico (fattore K), del numero di inserzioni/ora Z_r e del numero di ore di funzionamento. b) Dalla coppia M_{r2}, conoscendo n_2 e il rendimento dinamico η_d, ricavare la potenza in entrata.	a) <i>Determine service factor f_s according to type of duty (factor K), number of starts per hour Z_r and hours of operation.</i> b) <i>From values of torque M_{r2}, speed n_2 and efficiency η_d the required input power can be calculated from the equation:</i>	a) Den Betriebsfaktor f_s in Abhängigkeit von der Belastungsart (Faktor K), den Schaltungen /Stunde Z_r und den Betriebsstunden bestimmen. b) Aus dem Drehmoment M_{r2} mit Hilfe der bekannten Werte für n_2 und dem dynamischen Wirkungsgrad η_d die Antriebsleistung ableiten.	a) <i>Déterminer le facteur de service f_s en fonction du type de charge (facteur K), du nombre d'insertions/heure Z_r et du nombre d'heures de fonctionnement.</i> b) <i>A partir du couple M_{r2}, en connaissant n_2 et le rendement dynamique η_d, calculer la puissance en entrée.</i>
$P_{r1} = \frac{M_{r2} \cdot n_2}{9550 \cdot \eta_d} \quad [\text{kW}]$ (8)			
Il valore di η_d per lo specifico riduttore può essere ricavato dal paragrafo 5.	<i>Value of η_d for the captioned worm gear can be sorted out from paragraph 5.</i>	Für das spezifische Getriebe kann der Wert η_d unter Paragraph 5 erhoben werden.	<i>Il valeur de η_d pour le réducteur spécifique peut être calculée d'après les indications du paragraphe 5.</i>
c) Ricercare fra le tabelle dei dati tecnici motoriduttori quella corrispondente ad una potenza normalizzata P_n tale che:	c) <i>Consult the gearmotor selection charts and locate the table corresponding to normalised power P_n.</i>	c) Unter den Tabellen mit den Technischen Daten der Getriebemotoren die Tabelle auswählen, die folgender Leistung entspricht:	c) <i>Rechercher parmi les tableaux des caractéristiques techniques des motoréducteurs celui correspondant à une puissance:</i>
$P_n \geq P_{r1}$ (9)			
Se non diversamente indicato, la potenza P_n dei motori riportata a catalogo si riferisce al servizio continuo S1. Per i motori utilizzati in condizioni diverse da S1, sarà necessario identificare il tipo di servizio previsto con riferimento alle Norme CEI 2-3/IEC 34-1. In particolare, per i servizi da S2 a S8 e per le grandezze motore uguali o inferiori a 132, è possibile ottenere una maggiorazione della potenza rispetto a quella prevista per il servizio continuo, pertanto la condizione da soddisfare sarà:	<i>Unless otherwise specified, power P_n of motors indicated in the catalogue refers to continuous duty S1. For motors used in conditions other than S1, the type of duty required by reference to CEI 2-3/IEC 34-1 Standards must be mentioned. For duties from S2 to S8 in particular and for motor frame 132 or smaller, extra power output can be obtained with respect to continuous duty. Accordingly the following condition must be satisfied:</i>	Wenn nicht anders angegeben, bezieht sich die im Katalog angegebene Leistung P_n der Motoren auf Dauerbetrieb S1. Bei Motoren, die unter anderen Bedingungen als S1 eingesetzt werden, muß die vorgesehene Betriebsart unter Bezug auf die CEI-Normen 2-3/IEC 34-1 bestimmt werden. Insbesondere kann man für die Betriebsarten S2 bis S8 (und für Motorbaugrößen gleich oder niedriger als 132) eine Überdimensionierung der Leistung relativ zu der für den Dauerbetrieb vorgesehenen Leistung erhalten; die zu erfüllende Bedingung ist dann:	<i>Sauf indication contraire la puissance P_n des moteurs indiquée dans le catalogue se réfère à un service continu S1. Pour les moteurs utilisés dans des conditions différentes du service S1, il sera nécessaire d'identifier le type de service prévu en se référant aux normes CEI 2-3/IEC 34-1. En particulier, pour les services de type S2 à S8 ou pour les tailles de moteurs égales ou inférieures à 132 il est possible d'obtenir une majoration de la puissance par rapport à celle prévue pour le service continu. Par conséquent, la condition à satisfaire sera:</i>
$P_n \geq \frac{P_{r1}}{f_m}$ (10)			
Il fattore di maggiorazione f_m è ricavabile dalla tabella (A7).	<i>The adjusting factor f_m can be obtained from table (A7).</i>	Der Überdimensionierungsfaktor f_m kann der Tabelle (A7) entnommen werden.	<i>Le facteur de majoration f_m peut être obtenu en consultant le tableau (A7).</i>

**Rapporto di intermittenza****Intermittence ratio****Relative Einschaltdauer****Rapport d'intermittence**

$$I = \frac{t_f}{t_f + t_r} \cdot 100 \quad (11)$$

t_f = tempo di funzionamento a carico costante

t_r = tempo di riposo

t_f = work time at constant load

t_r = rest time

t_f = Betriebszeit mit konstanter Belastung

t_r = Aussetzzeit

t_f = temps de fonctionnement à charge constante

t_r = temps de repos

(A7)

	SERVIZIO / DUTY / BETRIEB / SERVICE						S4 - S8 Interpellarci Please contact us Rückfrage Nous contacter
	S2			S3*			
	Durata del ciclo / Cycle duration [min] Zyklusdauer / Durée du cycle [min]			Rapporto di intermittenza / Cyclic duration factor (I) Relative Einschaltdauer / Rapport d'intermittence (I)			
	10	30	60	25%	40%	60%	
f _m	1.35	1.15	1.05	1.25	1.15	1.1	

* La durata del ciclo dovrà comunque essere uguale o inferiore a 10 minuti; se superiore interpellare il Servizio Tecnico di Bonfiglioli Riduttori.

* Cycle duration, in any event, must be 10 minutes or less. If it is longer, please contact our Technical Service.

* Die Zyklusdauer muß in jedem Fall kleiner oder gleich 10 min sein; wenn sie darüber liegt, unseren Technisch en Kundendienst zu Rate ziehen.

* La durée du cycle devra être égale ou inférieure à 10 minutes. Si supérieure, contacter notre Service Technique.

Nella sezione relativa alla potenza installata P_n selezionare infine il motoriduttore che sviluppa la velocità di funzionamento più prossima alla velocità n_2 desiderata e per il quale il fattore di sicurezza S sia uguale, o superiore, al fattore di servizio f_s .

Next, refer to the appropriate P_n section within the gearmotor selection charts and locate the unit that features the desired output speed n_2 , or closest to, along with a safety factor S that meets or exceeds the applicable service factor f_s .

Als nächstes wählen Sie anhand der Getriebemotoren auswahltabellen den Abschnitt mit der entsprechenden P_n und suchen die gewünschte Abtriebsdrehzahl n_2 , oder die nächstmögliche Drehzahl, zusammen mit dem Sicherheitsfaktor S , der den zutreffenden Betriebsfaktor f_s erreicht oder überschreitet. Der Sicherheitsfaktor wird wie folgt berechnet:

Dans la section relative à la puissance installée P_n sélectionner enfin le motoréducteur qui développe la vitesse de fonctionnement la plus proche à la vitesse n_2 désirée et pour lequel le facteur de sécurité S soit pareil, ou supérieur, au facteur de service f_s .

Il fattore di sicurezza è così definito:

The safety factor is so defined:

Le facteur de sécurité est défini ainsi:

$$S = \frac{Mn_2}{M_2} = \frac{Pn_1}{P_1} \quad (12)$$

Nelle tabelle di selezione motoriduttori gli abbinamenti sono sviluppati con motori a 2, 4 e 6 poli alimentati a 50 Hz.

Per velocità di comando diverse da queste, effettuare la selezione con riferimento ai dati nominali forniti per i riduttori.

As standard, gear and motor combinations are implemented with 2, 4 and 6 pole motors, 50 Hz supplied.

Should the drive speed be different from 2800, 1400 or 900 min⁻¹, base the selection on the gear unit nominal rating.

Standardmäßig stehen Getriebemotorenkombinationen mit 2, 4 und 6 poligen Motoren für eine Frequenz von 50 Hz zur Verfügung. Sollten die Antriebsdrehzahlen abweichend von 2800, 1400 oder 900 min⁻¹ sein, dann stützen Sie die Auslegung des Getriebes auf die Getriebeenddaten.

Dans les tableaux de sélection des motoréducteurs les accouplements sont développés avec moteurs à 2, 4 et 6 poles alimentés à 50 Hz. Pour vitesses de commande différentes à celles-ci, sélectionner suite aux données nominales fournies par les réducteurs.

Scelta dei riduttori e dei riduttori predisposti per motori IEC**Selection of speed reducer and gearbox with IEC motor adapter****Wahl des Getriebes und Getriebe für IEC-motoren****Sélection des réducteurs et des réducteurs CEI**

a) Determinare il fattore di servizio f_s .

b) Conoscendo la coppia M_{r2} di uscita richiesta dalla applicazione, si procede alla definizione della coppia di calcolo:

a) Determine service factor f_s .

b) Assuming the required output torque for the application M_{r2} is known, the calculation torque can be then defined as:

a) Den Betriebsfaktor f_s bestimmen.

b) Anhand des bekannten von der Anwendung geforderten Abtriebsdrehmoments M_{r2} das Soll-Drehmoment bestimmen:

a) Déterminer le facteur de service f_s .

b) En connaissant le couple M_{r2} de sortie requis par l'application, l'on procède à la définition du couple de calcul:

$$M_{c2} = M_{r2} \cdot f_s \quad (13)$$



- c) In base alla velocità in uscita n_2 richiesta, e a quella in entrata n_1 disponibile, si calcola il rapporto di riduzione:
- c) *The gear ratio is calculated according to requested output speed n_2 and drive speed n_1 :*
- c) Auf Grundlage der verlangten Abtriebsdrehzahl n_2 und der verfügbaren Antriebsdrehzahl n_1 die Übersetzungs berechnen:
- c) *Suivant la vitesse en sortie n_2 requise et celle en entrée n_1 disponible, l'on calcule le rapport de réduction:*

$$i = \frac{n_1}{n_2} \quad (14)$$

Disponendo dei dati M_{c2} e i , si ricercherà nelle tabelle corrispondenti alla velocità n_1 il riduttore che, in funzione del rapporto $[i]$ più prossimo a quello calcolato, proponga una coppia nominale:

Once values for M_{c2} and i are known consult the rating charts under the appropriate input speed n_1 and locate the gear unit that features the gear ratio closest to $[i]$ and at same time offers a rated torque value M_{n2} so that:

Anhand der Werte für M_{c2} und i in den Tabellen für die Drehzahl n_1 das Getriebe auswählen, das in Abhängigkeit von einer Übersetzung $[i]$, die dem Sollwert möglichst nahe ist, folgendes Nenn-Drehmoment erlaubt:

En disposant des données M_{c2} et i , l'on recherchera dans les tableaux correspondant à la vitesse n_1 le réducteur qui, en fonction du rapport $[i]$ le plus proche de celui calculé, propose un couple nominal:

$$M_{n2} \geq M_{c2} \quad (15)$$

Se al riduttore scelto dovrà essere applicato un motore elettrico verificarne l'applicabilità consultando la tabella delle predisposizioni possibili al paragrafo 28.

If a IEC normalized motor must be fitted check geometrical compatibility with the gear unit at paragraph 28 - Motor availability.

Wenn das Getriebe mit einem Elektromotor verbunden werden soll, die Verträglichkeit anhand der Tabelle der möglichen Anbaumöglichkeiten sicherstellen.

Au cas où il serait nécessaire d'appliquer un moteur électrique normalisé au réducteur choisi, en vérifier la possible adaptation en consultant le tableau des prédispositions possibles présenté.

12 - VERIFICHE

Effettuata la selezione del riduttore, o motoriduttore, è opportuno procedere alle seguenti verifiche:

12 - VERIFICATION

After the selection of the speed reducer, or gearmotor, is complete it is recommended that the following verifications are conducted:

12 - PRÜFUNGEN

Nachdem die Auswahl des Getriebe oder Getriebemotor abgeschlossen ist, werden die folgenden Schritte empfohlen:

12 - VERIFICATIONS

Une fois effectuée la sélection du réducteur, ou motoréducteur, il faut procéder aux suivantes vérifications:

a) Potenza termica

Assicurarsi che la potenza termica del riduttore, abbia un valore uguale o maggiore alla potenza richiesta dall'applicazione secondo la relazione (3) a pag. 6, in caso contrario selezionare un riduttore di grandezza superiore oppure provvedere ad applicare un sistema di raffreddamento forzato.

a) Thermal capacity

Make sure that the thermal capacity of the gearbox is equal to or greater than the power required by the application according to equation (3) on page 6. If this condition is not verified, select a larger gearbox or apply a forced cooling system.

a) Thermische Grenzleistung

Sicherstellen, daß die Wärmeleistung des Getriebes größer oder gleich der verlangten Leistung ist, die von der Anwendung nach Gleichung (3) auf S. 6 verlangt wird. Andernfalls ein größer dimensioniertes Getriebe wählen bzw. ein Zwangskühlsystem vorsehen.

a) Puissance thermique

S'assurer que la puissance thermique du réducteur ait une valeur supérieure ou égale à la puissance requise par l'application selon l'équation (3) page 6. Dans le cas contraire, sélectionner un réducteur de taille supérieure ou bien prévoir un système de refroidissement forcé.

b) Coppia massima

Generalmente la coppia massima (intesa come punta di carico istantaneo) applicabile al riduttore non deve superare il 200% della coppia nominale M_{n2} ; verificare pertanto che tale limite non venga superato adottando, se necessario, opportuni dispositivi per la limitazione della coppia.

b) Maximum torque

The maximum torque (intended as instantaneous peak load) applicable to the gearbox must not, in general, exceed 200% of rated torque M_{n2} . Therefore, check that this limit is not exceeded, using suitable torque limiting devices, if necessary. For three-phase double speed motors, it is important

b) Max. Drehmoment

Im allgemeinen darf das max. Drehmoment (verstanden als momentane Lastspitze), das auf das Getriebe aufgebracht werden kann, 200 % des Nenndrehmoments M_{n2} nicht überschreiten. Sicherstellen, daß dieser Grenzwert nicht überschritten wird, und nötigenfalls die entsprechenden

b) Couple maximum

Généralement, le couple maximum (à considérer comme une pointe de charge instantanée) applicable au réducteur ne doit pas dépasser les 200% du couple nominal M_{n2} . Vérifier par conséquent que cette limite ne soit pas dépassée en adoptant, si nécessaire, des dispositifs adaptés pour limiter le couple.



Per i motori trifase a doppia polarità è necessario rivolgere particolare attenzione alla coppia di commutazione istantanea che viene generata durante la commutazione dall'alta velocità alla bassa in quanto può essere decisamente più elevata della coppia massima stessa. Un metodo semplice ed economico per ridurre tale coppia è quello di alimentare solo due fasi del motore durante la commutazione (il tempo di alimentazione a due fasi può essere regolato mediante un relè a tempo):

$M_{g2} = 0.5 \cdot M_{g3}$
 M_{g2} = Coppia di commutazione alimentando 2 fasi
 M_{g3} = Coppia di commutazione alimentando 3 fasi
Suggeriamo comunque di contattare il ns. Servizio Tecnico.

to pay attention to the switching torque which is generated when switching from high to low speed, because it could be significantly higher than maximum torque.
A simple, economical way to minimize overloading is to power only two phases of the motor during switch-over (power-up time on two phases can be controlled with a time-relay):

$M_{g2} = 0.5 \cdot M_{g3}$
 M_{g2} = Switching torque with two-phase power-up
 M_{g3} = Switching torque with three-phase power-up
We recommend, in any event, to contact our Technical Service.

Vorrichtungen zur Begrenzung des Drehmoments vorsehen.
Bei polumschaltbaren Drehstrommotoren muss dem Umschalt Drehmoment, das beim Umschalten von der hohen auf die niedrige Drehzahl erzeugt wird, besondere Aufmerksamkeit geschenkt werden, da es entschieden größer sein kann als das Nenn-Drehmoment.
Eine einfache und kostengünstige Methode zum Senken dieses Drehmoments besteht darin, daß nur zwei Phasen des Motors während des Umschaltens gespeist werden (die Dauer der Speisung von nur 2 Phasen kann durch ein Zeitrelais gesteuert werden):

$M_{g2} = 0.5 \cdot M_{g3}$
 M_{g2} = Umschalt Drehmoment bei Speisung von 2 Phasen;
 M_{g3} = Umschalt Drehmoment bei Speisung von 3 Phasen
Wir empfehlen jedoch in jedem Fall, unseren Technischen Kundendienst zu Rate zu ziehen.

Pour les moteurs triphasés à double polarité, il est nécessaire de prêter une attention particulière au couple de commutation instantané qui est généré lors du passage de la grande à la petite vitesse étant donné qu'il peut être considérablement plus élevé que le couple maximum lui-même.
Une méthode simple et économique pour réduire ce couple consiste à alimenter seulement deux phases du moteur pendant la commutation (la durée d'alimentation sur deux phases peut être réglée au moyen d'un relais temporisateur):

$M_{g2} = 0.5 \cdot M_{g3}$
 M_{g2} = Couple de commutation en alimentant deux phases
 M_{g3} = Couple de commutation en alimentant trois phases
Nous suggérons cependant de contacter notre Service Technique.

c) Carichi radiali

Verificare che i carichi radiali agenti sugli alberi di entrata e/o uscita rientrino nei valori di catalogo ammessi. Se superiori, aumentare la grandezza del riduttore oppure modificare la supportazione del carico.
Ricordiamo che tutti i valori indicati nel catalogo si riferiscono a carichi agenti sulla mezzeria della sporgenza dell'albero in esame per cui, in fase di verifica, è indispensabile tenere conto di questa condizione provvedendo, se necessario, a determinare con le apposite formule il carico ammissibile alla distanza x_{1-2} desiderata.
A tale proposito si rimanda ai paragrafi relativi ai carichi radiali.

c) Radial loads

Make sure that radial forces applying on input and/or output shaft are within permitting catalogue values. If they were higher consider designing a different bearing arrangement before switching to a larger gear unit.
Catalogue values for rated overhung loads refer to mid-point of shaft under study.
Should application point of the overhung load be localised further out the revised loading capability must be adjusted as per instructions given in this manual. See paragraph 22.

c) Radialkräfte

Sicherstellen, daß die auf die Antriebswellen und/oder Abtriebswellen wirkenden Radialkräfte innerhalb der zulässigen Katalogwerte liegen. Wenn sie höher sind, das Getriebe größer dimensionieren bzw. die Abstützung der Last verändern.
Wir erinnern daran, daß alle im Katalog angegebenen Werte sich auf Kräfte beziehen, die auf die Mitte des Wellenendes wirken. Diese Tatsache muß bei der Prüfung unbedingt berücksichtigt werden und nötigenfalls muß mit Hilfe der geeigneten Formeln die zulässige Kraft beim gewünschten Abstand x_{1-2} bestimmt werden.
Siehe hierzu die Erläuterungen zu den Radialkräften in diesem Katalog.

c) Charges radiales

Vérifier que les charges radiales agissant sur les arbres d'entrée et/ou de sortie se situent dans les valeurs de catalogue admises. Si elles sont supérieures, choisir la taille du réducteur supérieure ou modifier la reprise de charge. Rappelons que toutes les valeurs indiquées dans le catalogue se réfèrent à des charges agissant au milieu de la longueur disponible de l'arbre contrôlé. Par conséquent, en phase de vérification, il est indispensable de prendre en considération cette condition en déterminant, si nécessaire, avec les formules appropriées, la charge admissible à la distance x_{1-2} désirée. Se rapporter à ce propos aux paragraphes relatifs aux charges radiales.

d) Carichi assiali

Anche gli eventuali carichi assiali dovranno essere confrontati con i valori ammissibili.
Se si è in presenza di carichi assiali molto elevati o combinati con carichi radiali, si consiglia di interpellare il ns. Servizio Tecnico.

d) Thrust loads

Actual thrust load must be found within 20% of the equivalent overhung load capacity.
Should an extremely high, or a combination of radial and axial load apply, consult Bonfiglioli Technical Service.

d) Axialkräfte

Auch die eventuell vorhandenen Axialkräfte müssen mit den im Katalog angegebenen zulässigen Werten verglichen werden. Wenn sehr hohe Axialkräfte wirken oder Axialkräfte in Kombination mit Radialkräften, bitte unseren Technischen Kundendienst zu Rate ziehen.

d) Charges axiales

Les éventuelles charges axiales devront être comparées avec les valeurs admissibles. Si l'on est en présence de charges axiales très élevées ou combinées avec des charges radiales, nous conseillons d'interpeller notre Service Technique.



e) Avviamenti orari	e) Starts per hour	e) Schaltungen/Stunde	e) Démarrages/heure
Per servizi diversi da S1, con un numero rilevante di inserzioni/ora si dovrà tener conto di un fattore Z (determinabile con le indicazioni riportate nel capitolo dei motori) il quale definisce il numero max. di avviamenti specifico per l'applicazione in oggetto.	<i>For duties featuring a high number of switches the actual starting capability in loaded condition [Z] must be calculated. Actual number of starts per hour must be lower than value so calculated.</i>	Bei anderen Betriebsarten als S1 mit einem hohen Wert für die Schaltungen/Stunde muß der Faktor Z berücksichtigt werden (er kann mit Hilfe der Angaben im Kapitel Motoren bestimmt werden), der die max. zulässige Anzahl von Schalten für eine bestimmte Anwendung definiert.	<i>Pour les services différents de S1, avec un nombre important d'insertions/heure, il faudra prendre en considération un facteur Z (déterminé à l'aide des informations reportées dans le chapitre des moteurs) qui définit le nombre maximum de démarrages spécifique pour l'application concernée.</i>

13 - INSTALLAZIONE

È molto importante, per l'installazione del riduttore, attenersi alle seguenti norme:

13 - INSTALLATION

The following installation instructions must be observed:

13 - INSTALLATION

Für die Installation des Getriebes ist es äußerst wichtig, daß folgende Normen beachtet werden:

13 - INSTALLATION

Il est très important, pour l'installation du réducteur, de se conformer aux règles suivantes:

- | | | | |
|--|--|---|---|
| a) Assicurarsi che il fissaggio del riduttore, sia stabile onde evitare qualsiasi vibrazione. Installare (se si prevedono urti, sovraccarichi prolungati o possibili bloccaggi) giunti idraulici, frizioni, limitatori di coppia, ecc. | a) <i>Make sure that the gearbox is correctly secured to avoid vibrations.
If shocks or overloads are expected, install hydraulic couplings, clutches, torque limiters, etc.</i> | a) Sicherstellen, daß die Befestigung des Getriebes stabil ist, damit keine Schwingungen entstehen. Wenn es voraussichtlich zu Stößen, längerdauernden Überlasten oder zu Blockierungen kommen kann, sind entsprechende Schutzelemente wie hydraulische Kupplungen, Kupplungen, Rutschkupplungen usw. zu installieren. | a) <i>S'assurer que la fixation du réducteur soit stable afin d'éviter toute vibration. Installer (en cas de chocs, de surcharges prolongées ou de blocages) des coupleurs hydrauliques, des embrayages, des limiteurs de couple etc...</i> |
| b) Durante la verniciatura si dovranno proteggere i piani lavorati e il bordo esterno degli anelli di tenuta per evitare che la vernice ne essichi la gomma, pregiudicando la tenuta del paraolio stesso. | b) <i>Before being paint coated, the machined surfaces and the outer face of the oil seals must be protected to prevent paint drying out the rubber and jeopardising the sealing function.</i> | b) Beim Lackieren die bearbeiteten Flächen und die Dichtringe schützen, damit der Anstrichstoff nicht dem Kunststoff angreift und somit die Dichtigkeit der Ölabdichtungen in Frage gestellt wird. | b) <i>En phase de peinture, il faudra protéger les plans usinés et le bord extérieur des bagues d'étanchéité pour éviter que la peinture ne dessèche le caoutchouc, ce qui risque de nuire à l'efficacité du joint.</i> |
| c) Gli organi che vanno calettati sugli alberi di uscita del riduttore devono essere lavorati con tolleranza ISO H7 per evitare accoppiamenti troppo bloccati che, in fase di montaggio potrebbero danneggiare irreparabilmente il riduttore stesso. Inoltre, per il montaggio e lo smontaggio di tali organi si consiglia l'uso di adeguati tiranti ed estrattori utilizzando il foro filettato posto in testa alle estremità degli alberi. | c) <i>Parts fitted on the gearbox output shaft must be machined to ISO H7 tolerance to prevent interference fits that could damage the gearbox itself. Further, to mount or remove such parts, use suitable pullers or extraction devices using the tapped hole located at the top of the shaft extension.</i> | c) Die Organe, die mit einer Keilverbinding auf der Abtriebswelle des Getriebes befestigt werden, müssen mit einer Toleranz ISO H7 gearbeitet sein, um allzu fest blockierte Verbindungen zu vermeiden, die eventuell zu einer irreparablen Beschädigung des Getriebes während des Einbaus führen könnten. Außerdem sind beim Ein- und Ausbau dieser Organe geeignete Zugstangen und Abzieher zu verwenden, wobei die Gewindebohrung an den Köpfen der Wellen zu verwenden ist. | c) <i>Les organes qui sont calés sur les arbres de sortie du réducteur doivent être réalisés avec une tolérance ISO H7 pour éviter les accouplements trop serrés qui, en phase de montage, pourraient endommager irrémédiablement le réducteur. En outre, pour le montage et le démontage de ces organes, nous conseillons d'utiliser un outillage et des extracteurs appropriés en utilisant le trou taraudé situé en extrémité d'arbre.</i> |
| d) Le superfici di contatto dovranno essere pulite e trattate con adeguati protettivi prima del montaggio, onde evitare l'ossidazione e il conseguente bloccaggio delle parti. | d) <i>Mating surfaces must be cleaned and treated with suitable protective products before mounting to avoid oxidation and, as a result, seizure of parts.</i> | d) Die Berührungsflächen müssen sauber sein und vor der Montage mit einem geeigneten Schutzmittel behandelt werden, um Oxidierung und die daraus folgende Blockierung der Teile zu verhindern. | d) <i>Les surfaces de contact devront être propres et traitées avec des produits de protections appropriés avant le montage afin d'éviter l'oxydation et par suite le blocage des pièces.</i> |



- | | | | |
|--|--|--|---|
| e) Prima della messa in servizio del riduttore accertarsi che la macchina che lo incorpora sia in regola con le disposizioni della Direttiva Macchine 89/392 e successivi aggiornamenti. | e) <i>Prior to putting the gear unit into operation make sure that the equipment that incorporates the same complies with the current revision of the Machines Directive 89/392.</i> | e) Bevor das Getriebe im Betrieb zu setzen, muß man sich vergewissern daß die das Getriebe einbauende Maschine gemäß den aktuellen Regelungen der Maschine Richtlinie 89/392 ist. | e) <i>Avant la mise en service du réducteur, vérifier que la machine où il est monté est conforme aux normes de la Directive Machines 89/392 et ses mises à jour.</i> |
| f) Prima della messa in funzione della macchina, accertarsi che la posizione del livello del lubrificante sia conforme alla posizione di montaggio del riduttore e che la viscosità sia adeguata al tipo del carico (vedi tabella B3). | f) <i>Before starting up the machine, make sure that oil level conforms to the mounting position specified for the gear unit.</i> | f) Vor Inbetriebnahme der Maschine sicherstellen, daß die Anordnung der Füllstandschrabe der Einbaulage angemessen ist, und die Viskosität des Schmiermittels der Belastungsart entspricht (siehe Tabelle B3). | f) <i>Avant la mise en marche de la machine, s'assurer que la position du niveau du lubrifiant soit conforme à la position de montage du réducteur et que la viscosité soit appropriée au type de charge (voir tableau B3).</i> |
| g) Nel caso di installazione all'aperto prevedere adeguate protezioni e/o carterature allo scopo di evitare l'esposizione diretta agli agenti atmosferici e alla radiazione solare. | g) <i>For outdoor installation provide adequate guards in order to protect the drive from rainfalls as well as direct sun radiation.</i> | g) Bei Inbetriebnahme in Frein, muß man geeigneten Schutzgeräte vorsehen, um das Antrieb gegen Regen und direkte Sonnenstrahlung zu schützen. | g) <i>En cas d'installation en plein air, il est nécessaire d'appliquer des protections et/ou des caches appropriés de façon à éviter l'exposition directe aux agents atmosphériques et aux rayonnements solaires.</i> |

14 - STOCCAGGIO

Il corretto stoccaggio dei prodotti ricevuti richiede l'esecuzione delle seguenti attività:

- a) Escludere aree all'aperto, zone esposte alle intemperie o con eccessiva umidità.
- b) Interporre sempre tra il pavimento ed i prodotti, pianali lignei o di altra natura, atti ad impedire il diretto contatto col suolo.
- c) Per periodi di stoccaggio e soste prolungate le superfici interessate agli accoppiamenti quali flange, alberi e giunti devono essere protette con idoneo prodotto antiossidante (Mobilarma 248 o equivalente). In questo caso i riduttori dovranno essere posizionati con il tappo di sfiato nella posizione più alta e riempiti interamente d'olio. Prima della loro messa in servizio nei riduttori dovrà essere ripristinata la corretta quantità, e il tipo di lubrificante.

14 - STORAGE

Observe the following instructions to ensure correct storage of the products:

- a) *Do not store outdoors, in areas exposed to weather or with excessive humidity.*
- b) *Always place boards, wood or other material between the products and the floor. The gearboxes should not have direct contact with the floor.*
- c) *In case of long-term storage all machined surfaces such as flanges, shafts and couplings must be coated with a suitable rust inhibiting product (Mobilarma 248 or equivalent). Furthermore gear units must be placed with the fill plug in the highest position and filled up with oil. Before putting the units into operation the appropriate quantity, and type, of oil must be restored.*

14 - LAGERUNG

Die korrekte Lagerung der Antriebe erfordert folgende Vorkehrungen:

- a) Die Produkte nicht im Freien lagern und nicht in Räumen, die der Witterung ausgesetzt sind, oder eine hohe Feuchtigkeit aufweisen.
- b) Die Produkte nie direkt auf dem Boden, sondern auf Unterlagen aus Holz oder einem anderen Material lagern.
- c) Bei anhaltenden Lager- und Haltszeiten müssen die Oberflächen für die Verbindung, wie Flansche, Wellen oder Kupplungen mit einem geeigneten Oxidationsschutzmittel behandelt werden (Mobilarma 248 oder ein äquivalentes Mittel). Übrigens müssen die Getriebe mit nach oben gerichteter Entlüftungsschraube gelagert und mit Öl gefüllt werden. Die Getriebe müssen vor ihrer Verwendung mit der angegebenen Menge des vorgesehenen Schmiermittels gefüllt werden.

14 - STOCKAGE

Un correct stockage des produits reçus nécessite de respecter les règles suivantes:

- a) *Exclude les zones à ciel ouvert, les zones exposées aux intempéries ou avec humidité excessive.*
- b) *Interposer dans tous les cas entre le plancher et les produits des planches de bois ou des supports d'autre nature empêchant le contact direct avec le sol.*
- c) *Pour une stockage de long durée il faut protéger les surfaces d'accouplement (brides, arbres, manchon d'accouplement) avec produit anti oxydant (Mobilarma 248 ou equivalent). Dans ce cas les réducteurs devront être placés avec bouchon reniflard vers le haut et complètement rempli d'huile. Avant de la mise en service du réducteur, la bon quantité d'huile devra être rétabli selon la quantité indiquée sur le catalogue.*

**15 - CONDIZIONI DI FORNITURA**

I riduttori vengono forniti come segue:

- a) già predisposti per essere installati nella posizione di montaggio come definito in fase di ordine;
- b) collaudati secondo specifiche interne;
- c) le superfici di accoppiamento non sono verniciate;
- d) provvisti di dadi e bulloni per montaggio motori per la versione IEC;
- e) dotati di protezioni in plastica sugli alberi;
- f) provvisti di golfare di sollevamento (dove previsto).

15 - CONDITIONS OF SUPPLY

Gear units are supplied as follows:

- a) *configured for installation in the mounting position specified when ordering;*
- b) *tested to manufacturer specifications;*
- c) *mating machined surfaces come unpainted;*
- d) *nuts and bolts for mounting motors are provided;*
- e) *shafts are protected during transportation by plastic caps;*
- f) *supplied with lifting lug (where applicable).*

15 - LIEFERBEDINGUNGEN

Die Getriebe werden in folgendem Zustand geliefert:

- a) schon bereit für die Montage in der bei Bestellung festgelegten Einbaulage;
- b) nach werksinternen Spezifikationen geprüft;
- c) die Verbindungsflächen sind nicht lackiert;
- d) ausgestattet mit Schrauben und Muttern für die Montage der Motoren (Version mit Adapter für IEC-Motoren);
- e) alle Getriebe werden mit Kunststoffschutz auf den Wellen geliefert;
- f) mit Transporterring zum Anheben (falls vorgesehen).

15 - CONDITIONS DE LIVRAISON

Les réducteurs sont livrés comme suit:

- a) *déjà prédisposés pour être installés dans la position de montage comme défini en phase de commande;*
- b) *testés selon les spécifications internes;*
- c) *les surfaces de liaison ne sont pas peintes;*
- d) *équipés d'écrous et de boulons pour le montage des moteurs normalisés pour la version CEI;*
- e) *embouts de protections en plastique sur les arbres;*
- f) *dotés d'un crochet de levage (quand cela est prévu).*

16 - SPECIFICHE DELLA VERNICE

Le specifiche della vernice applicata sui riduttori (dove previsto) potranno essere richieste alle filiali o ai distributori che hanno fornito i gruppi.

16 - PAINT SPECIFICATIONS

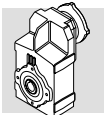
Specifications for paint applied to gearboxes (where applicable) may be obtained from the branches or dealers that supplied the units.

16 - ANGABEN ZU DEN ANSTRICHSTOFFE

Die Spezifikationen des Lackes, der auf den Getriebe (wo erforderlich) verwendet wurde, können bei den Filialen oder Verkaufsstellen, die die Gruppen geliefert haben, angefordert werden.

16 - SPECIFICATIONS DE LA PEINTURE

Les spécification de la peinture appliquée sur les réducteurs pourront, le cas échéant, être demandées aux filiales ou aux distributeurs ayant fourni les groupes.



17 - CARATTERISTICHE COSTRUTTIVE

Le caratteristiche costruttive salienti sono:

- modularità
- compattezza
- montaggi universali
- rendimenti elevati
- basso livello di rumorosità
- ingranaggi in acciaio legato cementati e temprati
- casse in alluminio non verniciate nelle grandezze 10, 20, casse in ghisa ad alta resistenza verniciate, nelle altre grandezze.

17 - DESIGN FEATURES

The main design characteristics are:

- *modularity*
- *space effectiveness*
- *universal mounting*
- *high efficiency*
- *quite operation*
- *gears in hardened and case-hardened steel*
- *bare aluminium housing for sizes 10, 20, high strength painted cast-iron housings for larger frame sizes.*

17 - KONSTRUKTIVE EIGENSCHAFTEN

Die wichtigsten konstruktiven Eigenschaften sind:

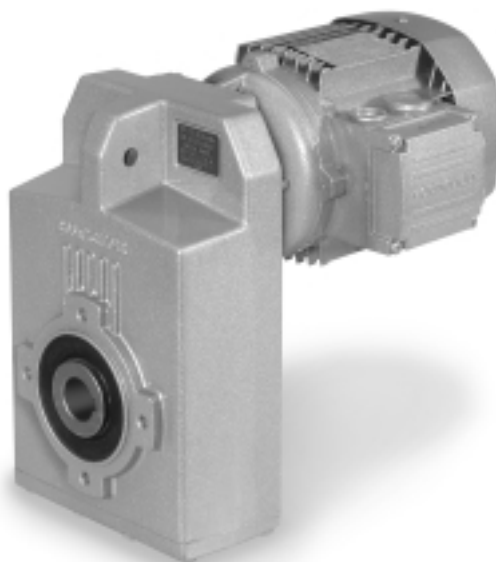
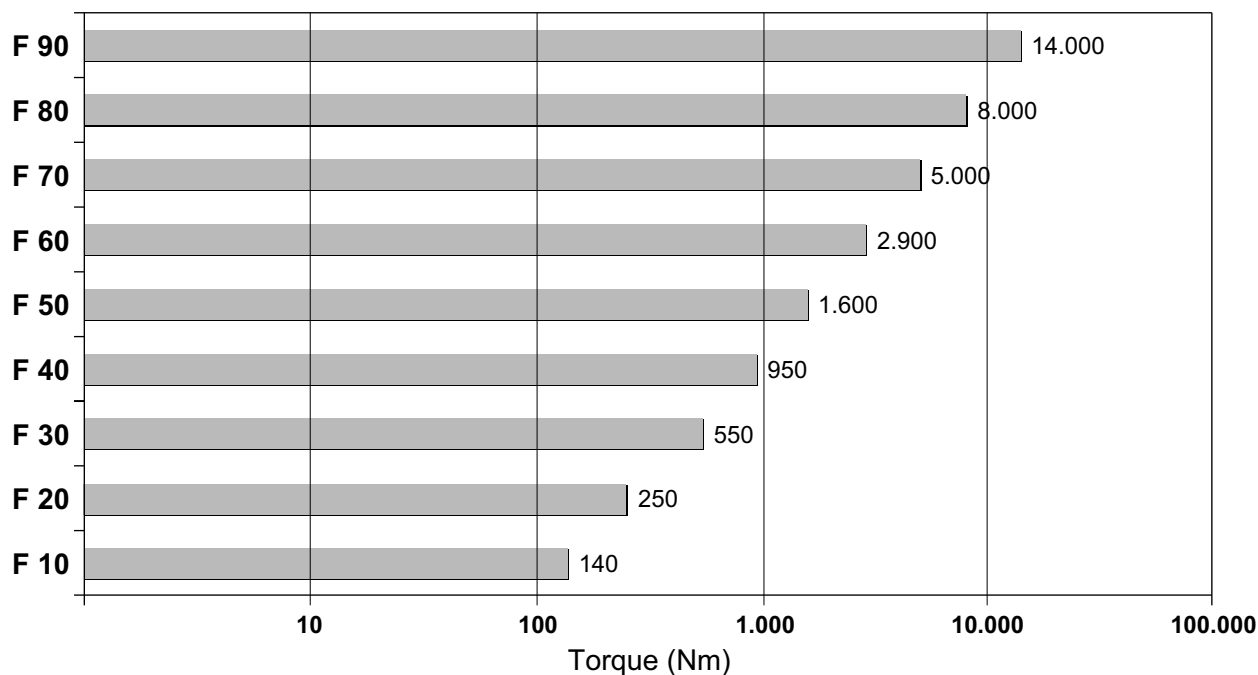
- Baueinheitensystem
- Kompaktheit
- universelle Montage
- hohe Wirkungsgrade
- niedriger Geräuschpegel
- einsatzgehärtete und gehärtete Zahnräder aus legiertem Stahl
- Nicht lackierten Aluminiumgehäuse bei den Größen 10, 20; hochwiderstandsfähige und lackierte Gußgehäuse bei den anderen Größen.

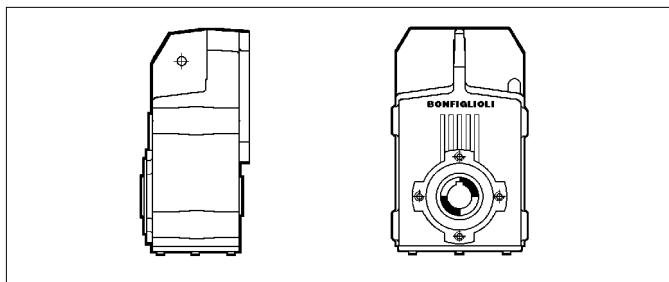
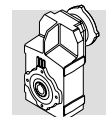
17 - CARACTERISTIQUES DE CONSTRUCTION

Les principales caractéristiques de construction sont:

- *modularité*
- *compacité*
- *montages universels*
- *rendements élevés*
- *faible niveau de bruit*
- *engrenages en acier allié cimentés et trempés*
- *carters en aluminium non peints dans les tailles 10, 20, carters en fonte à haute résistance peints dans les autres tailles.*

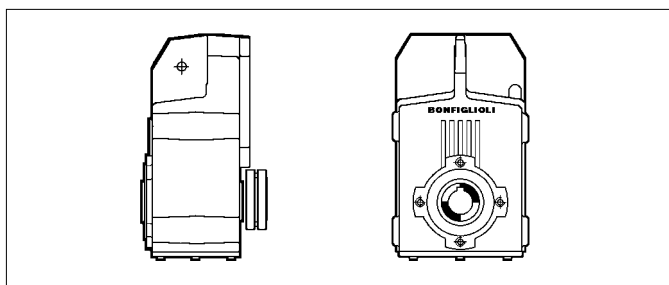
(B1)





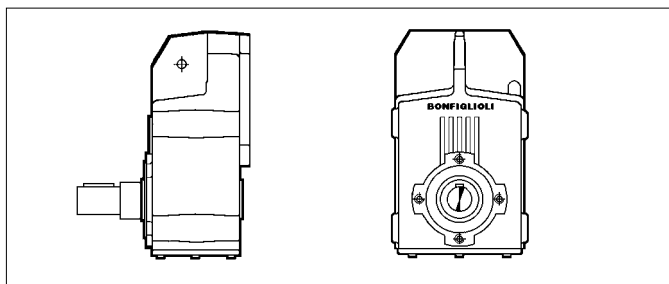
H

Albero lento cavo con cava per linguetta
Keyed hollow output shaft
Abtriebshohlwelle mit Federnut
Arbre lent creux claveté



S

Albero lento cavo e calettatore
Hollow output shaft and shrink disc
Abtriebshohlwelle mit Schrumpfscheibe
Arbre lent creux et frette de serrage



R

Albero lento cilindrico
Solid output shaft
Abtriebsvollwelle
Arbre lent sortant

**Forme costruttive con flangia
riportata**

**Basic versions with bolt-on
flange**

**Bauformen mit aufgesetztem
Flansch**

**Formes de construction avec
bride rapportée**

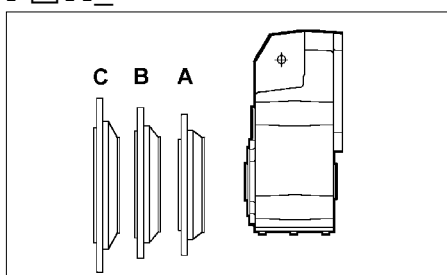
Gli schemi riportati evidenziano
le flange applicabili alle forme
costruttive base.

The diagrams show how the
mounting flanges bolt onto the
gear unit.

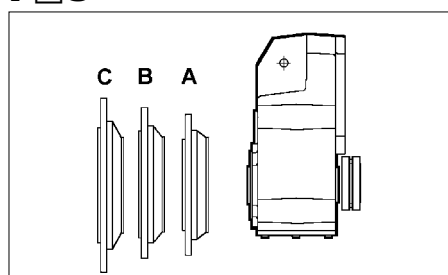
Die angegebenen Bilder zeigen
die den Grundbauformen an-
baubaren Flansche.

Les schémas reportés défi-
nissent les brides applicables
aux formes de construction
standard.

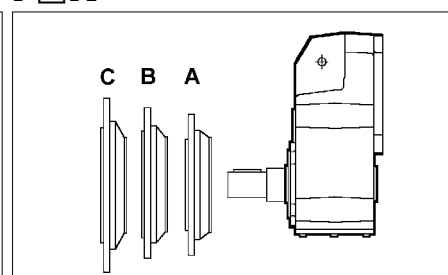
F H

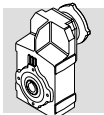


F S



F R





19 - DESIGNAZIONE

19 - DESIGNATION

19 - BEZEICHNUNG

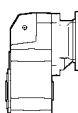
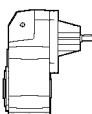
19 - DESIGNATION

RIDUTTORE / GEAR UNIT
GETRIEBE / REDUCTEUR**F 10 2 H30 FA 48.7 S1 H5**OPZIONI / OPTIONS
OPTIONEN / OPTIONS

22

POSIZIONE DI MONTAGGIO / MOUNTING POSITION
EINBAULAGEN / POSITION DE MONTAGE

25

H1 (Standard), H2, H3, H4, H5, H6DESIGNAZIONE INGRESSO / INPUT CONFIGURATION
BEZEICHNUNG DER ANTRIEBSSEITE / DESIGNATION ENTREE**S05****S1****S2****S3****S4****S5****P63****P71****P80****P90****P100****P112****P132****P160****P180****P200****P225****P250****HS**RAPPORTO DI RIDUZIONE / GEAR RATIO
ÜBERSETZUNG / RAPPORT DE REDUCTION

GRANDEZZA FLANGIA DI USCITA (specificare solo se richiesta)

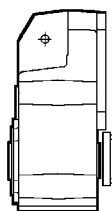
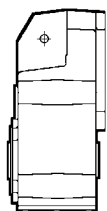
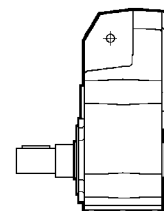
OUTPUT FLANGE SIZE (specify only if requested)

BAUGRÖSSE ANTRIEBSFLANSCH (angeben nur wenn angefragt)

TAILLE BRIDE EN SORTIE (spécifier seulement sur demande)

F = Versione flangiata / Flanged version / Ausführung mit Flansch / Version avec bride**A,B,C** = Grandezza flangia / Flange size / Flanschgröße / Taille bride

FORMA COSTRUTTIVA / VERSION / BAUFORM / FORME DE CONSTRUCTION

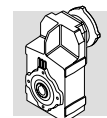
**S****R**

	H									
	F102	F202	F302	F402	F502	F603	F703	F803	F903	
		F203	F303	F403	F503	F604	F704	F804	F904	
Standard	H25	H30	H35	H40	H50	H60	H80	H90	H100	
Alternative	H30	H35	H40	H45	H55	H70	H70	H80	H90	

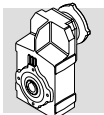
Diametri alternativi a richiesta
Alternative diameters available on request
Alternative Durchmesser auf Anfrage
Diamètres alternatifs sur demandeSTADI DI RIDUZIONE / REDUCTIONS
GETRIEBESTUFEN / ETAGES DE REDUCTION**2** (F 10...F 50), **3** (F 20...F 90), **4** (F 30...F 90)

GRANDEZZA RIDUTTORE / GEAR FRAME SIZE / GETRIEBEBAUGRÖSSE / TAILLE REDUCTEUR

10, 20, 30, 40, 50, 60, 70, 80, 90TIPO RIDUTTORE: **F** = pendolare
GETRIEBETYP: **F** = AufsteckgetriebeGEARBOX TYPE: **F** = helical shaft-mounted
TYPE DU REDUCTEUR: **F** = pendulaires



Designazione motore	Motor designation	Motor bezeichnung	Designation moteur
MOTORE / MOTOR MOTOR / MOTEUR		FRENO / BRAKE BREMSE / FREIN	
M 1LA 4 230/400-50 IP54 CLF W FD 7.5 R SB 220 SA			
			OPZIONI OPTIONS OPTIONEN OPTIONS 22
		ALIMENTAZ. FRENO BRAKE SUPPLY BREMSVERSORGUNG ALIMENTATION FREIN 140 145 149	
		TIPO RADDRIZZATORE AC/DC RECTIFIER TYPE GLEICHRICHTERTYP TYPE ALIMENTATEUR NB, SB, NBR, SBR 141	
		LEVA DI SBLOCCO FRENO BRAKE HAND RELEASE BREMSENTHANDLÜFTUNG LEVIER DE DEBLOCAGE FREIN R, RM 152	
		COPPIA FRENANTE / BRAKE TORQUE BREMSMOMENT/ COUPLE FREIN 142 146 150	
		TIPO FRENO / BRAKE TYPE BRESENTYP / TYPE DE FREIN 142 146 150 FD (freno c.c./ d.c. brake / G.S. Bremse / frein c.c.) FA, BA (freno c.a./ a.c. brake / W.S. Bremse / frein c.a.)	
		POSIZIONE MORSETTIERA / TERMINAL BOX POSITION KLEMMENKASTENLAGE / POSITION BOITE A BORNE W (default), N, E, S 25	
		FORMA COSTRUTTIVA / MOTOR MOUNTING BAUFORM / FORM DE CONSTRUCTION — (motore integrato / compact motor kompaktes Motor / moteur compact) B5 (motore IEC / IEC - motor / IEC Motor / moteur CEI)	
		CLASSE ISOLAMENTO / INSULATION CLASS ISOLIERUNGSKLASSE / CLASSE ISOLATION CL F standard CL H option 133	
		GRADO DI PROTEZIONE / DEGREE OF PROTECTION SCHUTZART / DEGRE DE PROTECTION IP55 standard (IP54 - motore autofrenante / brake motor / Bremssmotor / moteur frein) 127	
		TENSIONE - FREQUENZA / VOLTAGE - FREQUENCY SPANNUNG - FREQUENZ / TENSION - FREQUENCE 131	
		NUMERO DI POLI / POLE NUMBER / POLZAHL / N.bre POLES 2, 4, 6, 2/4, 2/6, 2/8, 2/12, 4/6, 4/8	
		GRANDEZZA MOTORE / MOTOR SIZE / MOTOR-BAUGRÖSSE / TAILLE MOTEUR 05A - 5LA (motore integrato / compact motor / kompaktes Motor / moteur compact) 63A - 250M (motore IEC / IEC motor / IEC - motor / moteur CEI)	
		TIPO MOTORE/ MOTOR TYPE / MOTORTYP / TYPE MOTEUR M = trifase integrato / compact 3-phase / kompaktes Dreiphasen / 3 phase compact BN = trifase IEC / IEC 3-phase / IEC Dreiphasen / 3 phase CEI	



Opzioni riduttori

AL, AR

Dispositivo antiretro.

SO

I riduttori F 10, F 20, F 30 solitamente forniti con lubrificante da BONFIGLIOLI RIDUTTORI, sono forniti privi di lubrificante.

LO

I riduttori F 40, F 50, F 60, F 70, F 80, F 90, solitamente sprovvisti di lubrificante, sono richiesti con olio sintetico del tipo correntemente utilizzato dalla BONFIGLIOLI RIDUTTORI e riempiti in accordo alla posizione di montaggio richiesta.

DV

2 Anelli di tenuta sull'albero veloce. (Disponibile solo sui motoriduttori compatti).

VV

Anello di tenuta in Viton® sull'albero veloce.

PV

Tutti gli anelli di tenuta in Viton®.

FL

Spianatura e foratura per fissaggio laterale (F 10...F 60). (Standard per F 70, F 80 e F 90).

Gearbox options

AL, AR

Anti-run back device.

SO

Gear units F 10, F 20 and F 30 usually factory filled with oil, to be supplied unlubricated.

LO

Gearboxes F 40, F 50, F 60, F 70, F 80, F 90, usually supplied without oil, to be supplied with synthetic oil currently used by BONFIGLIOLI RIDUTTORI and filled according to the mounting position specified.

DV

Dual oil seals on input shaft. (Only available for integral gearmotors).

VV

Viton oil seal on input shaft.

PV

Both input and output shafts feature Viton® oil seals.

FL

Machined and drilled flats for side mounting (F 10 through F 60). (Default for F 70, F 80 and F 90).

Getriebe Optionen

AL, AR

Rücklaufsperr.

SO

Bei Lieferung ohne Schmierstoff (nur bei F 10, F 20 und F 30).

LO

Für Getriebe F 40, F 50, F 60, F 70, F 80, F 90, die gewöhnlich ohne Schmiermittel geliefert werden, in Übereinstimmung mit der Einbaulage gefüllt mit dem normalerweise von BONFIGLIOLI RIDUTTORI verwendeten synthetischen Schmierstoff.

DV

2 Wellendichtringe auf der eintreibenden Welle. (Nur für Kompaktgetriebemotoren).

VV

Wellendichtringe aus Viton® auf der eintreibenden Welle.

PV

Alle Wellendichtringe aus Viton®.

FL

Planschnitt und bohrungen für seitliche Befestigung (F 10...F 60). (Standard für F 70, F 80 und F 90).

Options réducteurs

AL, AR

Dispositif antiretour.

SO

Les réducteurs F 10, F 20, F 30, habituellement fournis avec lubrifiant par la société BONFIGLIOLI RIDUTTORI, sont demandés sans lubrifiant.

LO

Les réducteurs F 40, F 50, F 60, F 70, F 80, F 90, habituellement dépourvus de lubrifiants, sont demandés avec huile synthétique du type couramment utilisé par BONFIGLIOLI RIDUTTORI et remplis conformément à la position de montage demandée.

DV

2 bagues d'étanchéité sur l'arbre rapide. (Disponible seulement sur motoréducteurs compacts).

VV

Bague d'étanchéité en Viton® sur l'arbre rapide.

PV

Toutes les bagues d'étanchéité en Viton®.

FL

Surfaçage et perçage pour assemblage latéral (F 10...F 60). (Standard pour F 70, F 80 et F 90).

Opzioni motori

AA, AC, AD

Posizione angolare leva di sblocco freno rispetto alla posizione morsettiera visto lato ventola.

Posizione standard = 90° orari.

AA = 0°, AC = 180°,

AD = 90° antiorari.

AL, AR

Antiretro (solo per motori di tipo M). Rotazione antioraria per motoriduttore a 2, 4 stadi di riduzione e oraria per motoriduttore a 3 stadi, guardando l'albero lento del motoriduttore.

Motor options

AA, AC, AD

Mutual position of the brake release lever and terminal box. View is from the fan side.

Standard position = 90° clockwise.

AA = 0°, AC = 180°,

AD = 90° counterclockwise.

AL, AR

Anti run back (only for motors type M).

CCW rotation for 2, 4 reduction stage gear motors and CW for 3 reduction stage motors viewing from gearbox output shaft.

Optionen Motoren

AA, AC, AD

geben die Lage des Bremslüfterhebels zum Klemmenkasten an. Standard ist 90° im Uhrzeigersinn beim Ansehen der Lüfterradseite.

AA = 0°, AC = 180°,

AD = 90° entgegen dem Uhrzeigersinn.

AL, AR

Rücklaufsperr (nur für Motoren des Typs M). Drehung entgegen dem Uhrzeigersinn für 2, 4 stufige Getriebemotoren und Drehung im Uhrzeigersinn für 3 stufige Getriebemotoren beim Anschauen der Getriebeabtriebswelle.

Options moteurs

AA, AC, AD

Position angulaire du levier de déblocage du frein par rapport à la position de la boîte à borne en regardant du côté du ventilateur.

Position standard = 90° sens horaire.

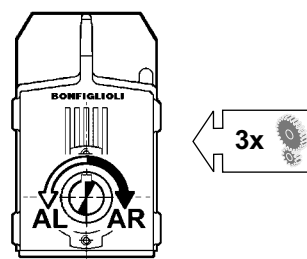
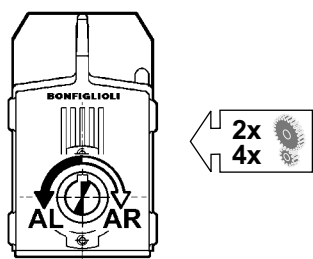
AA = 0°, AC = 180°,

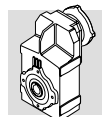
AD = 90° sens anti-horaire.

AL, AR

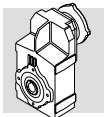
Dispositif anti-retour (seulement pour moteurs de type M). Rotation anti-horaire pour motoréducteur à 2, 4 étages de réduction et horaire pour motoréducteur à 3 étages de réduction en regardant l'arbre lent du motoréducteur de face.

(B2)





CF Filtro capacitivo.	CF <i>Capacitive filter.</i>	CF Kapazitive filter.	CF <i>Filtre capacitif.</i>
D3 No. 3 sonde bimetalliche.	D3 <i>3 nos bimetallic thermostats.</i>	D3 3 Bimetallfühler.	D3 <i>3 sondes bimétalliques.</i>
E3 No. 3 termistori per motori a singola polarità e doppia polarità (in accordo alla classe di isolamento).	E3 <i>3 nos thermistors for single and double speed motors (according to the isolation class).</i>	E3 3 Kaltleiterthermistoren für ein- tourige Motoren und polum- schaltbaren Motoren (gemäß der Isolierstoffklasse).	E3 <i>3 thermistances pour moteurs à simple polarité ou double polarité (selon les classes d'isola- tion).</i>
F1 Volano per avviamento pro- gressivo.	F1 <i>Flywheel for soft start and stop.</i>	F1 Schwungrad zum sanften An- fahren.	F1 <i>Volant pour démarrage pro- gressif.</i>
H1 Riscaldatori anticondensa. Alimentazione standard 230V± 10%.	H1 <i>Anti condensate heaters. Stan- dard voltage 230V± 10%.</i>	H1 Wicklungsheizung Standardspannung 230 V± 10%	H1 <i>Réchauffeurs anticondensation. Alimentation standard 230V± 10%.</i>
PN Potenza a 60 Hz corrisponden- te alla potenza normalizzata a 50 Hz.	PN <i>60 Hz power corresponding to the normalized 50 Hz power.</i>	PN Die 60 Hz-Leistung wird an der 50 Hz-Normleistung ausgeglichen.	PN <i>Puissance à 60 Hz correspon- dante à la puissance norma- lisée à 50 Hz.</i>
PS Doppia estremità d'albero (esclude opzione RC e U1).	PS <i>Double shaft extention (barring RC and U1 options).</i>	PS Zweites Wellenende (schließt die Optionen RC und U1 aus).	PS <i>Double extrémité d'arbre (à l'exclusion de l'option RC et U1).</i>
RC Tettuccio parapigioggia (esclude opzione PS).	RC <i>Drip cover (barring option PS).</i>	RC Schutzdach (schließt Option PS aus).	RC <i>Capot protection antipluie (op- tion PS exclue).</i>
RV Bilanciamento rotore in grado di vibrazione R.	RV <i>Rotor balancing in vibration class R.</i>	RV Läufer in Vibrationsgrad R aus- gewuchtet.	RV <i>Equilibrage rotor avec degré de vibration R.</i>
TC La variante del tettuccio tipo TC è da specificare quando il moto- re è installato in ambienti dell'industria tessile. L'opzione esclude le varianti EN1, EN2, EN3 e non è applica- bile ai motori con freno tipo BA.	TC <i>Option TC is a rain canopy vari- ant for textile industry environ- ments. This option is not compatible with variants EN1, EN2, EN3 and will not fit motors equipped with a BA brake.</i>	TC Bei dieser Option handelt es sich um ein Schutzdachs mit ei- nem Textilnetz, dessen Einsatz empfohlen wird wenn der Motor in Bereichen der Textilindustrie installiert wird. Diese Option schließt die Mög- lichkeit der Optionen EN1, EN2, EN3 aus und kann bei Bremse- motoren vom Typ BN_BA nicht montiert werden.	TC <i>La variante du capot type TC est à spécifier lorsque le moteur est installé dans des sites de l'industrie textile. L'option exclue les variantes EN1, EN2, EN3 et n'est pas ap- plicable aux moteurs avec frein type BA.</i>
TP Tropicalizzazione.	TP <i>Tropicalization.</i>	TP Tropenfestigkeit.	TP <i>Tropicalisation.</i>
U1 Servoventilazione (esclude op- zioni PS e CUS).	U1 <i>Forced cooling (barring options PS and CUS).</i>	U1 Fremdbelüftung (Nicht anwend- bare Gesamtheit an den Optio- nen PS und CUS).	U1 <i>Servo-ventilateur (Pas appli- cable ensemble aux options PS et CUS).</i>
U2 Servoventilatore privo di scatola morsettiera, dotato di cavi pre- cablati internamente. Esclude le opzioni PS e CUS. Disponibile per motori: BN 71 ... BN 132, M1 ... M4.	U2 <i>Separate supply forced ventila- tion without terminal box. Ca- bles are pre-wired. Configura- tion is not compatible with op- tions PS and CUS. Available on motors; BN 71 ... BN 132, M1 ... M4.</i>	U2 Servoventilator ohne Klemmen- kasten, bereits intern verkabelt. Nicht anwendbare Gesamtheit an den Optionen PS und CUS. Verfügbar für folgende Motoren: BN 71 ... BN 132, M1 ... M4.	U2 <i>Servoventilateur sans boîte à bornes, doté de câbles précâ- blés à l'intérieur. Pas applicable ensemble aux options PS et CUS. Disponible pour moteurs: BN 71 ... BN 132, M1 ... M4.</i>
Per ulteriori informazioni sulle opzioni, consultare i relativi capitoli nella sezione motori elettrici.	For further information on options, consult the electric motors section.	Siehe die Kapitel im Teil Elek- tromotoren für weitere infor- mationen.	Pour de plus amples informa- tions sur les options, consul- ter la section moteurs électri- ques.



20 - LUBRIFICAZIONE

Gli organi interni dei riduttori Bonfiglioli sono lubrificati con un sistema misto di immersione e sbattimento dell'olio.

I gruppi F10, F20 e F30 sono normalmente consegnati con carica di lubrificante dalla fabbrica, o dalla rete di vendita ufficiale.

Per questi stessi gruppi, nell'esecuzione predisposta per motorizzazione normalizzata IEC, un tappo di sfiato è fornito a corredo e dovrà essere installato ad esclusione della posizione di montaggio V5, prima della messa in esercizio del riduttore. I gruppi di grandezza F 40 e superiore sono normalmente forniti privi di lubrificante, e sarà cura dell'utilizzatore riempirli di olio prima della messa in servizio.

Le tavole che seguono sono da riferimento nell'interpretazione delle posizioni di montaggio, della collocazione dei tappi di servizio e delle quantità di lubrificante.

Queste ultime sono indicative, e per il corretto riempimento si dovrà fare riferimento alla mezzeria del tappo, o dell'astina di livello, se presente.

Rispetto a questa condizione la quantità di lubrificante riportata in tabella può presentare scostamenti, occasionalmente anche rilevanti.

Il lubrificante "long life" fornito di serie è di natura sintetica e, a meno di contaminazione dall'esterno, non richiede sostituzioni periodiche per tutto l'arco di vita del riduttore. Lo stesso lubrificante consente inoltre funzionamenti a temperatura ambiente $0 < t_a < 50^\circ\text{C}$.

Per funzionamento a temperature inferiori consultare il ns. Servizio Tecnico.

20 - LUBRICATION

The inner parts of Bonfiglioli gear units are oil-bath and splash lubricated.

Frame sizes F10, F20 and F30 are supplied by the factory, or by the authorized dealers, already filled with oil.

For same units configured with the IEC-normalized motor mounting flange a breather plug is also supplied. With the exception of the V5 mounting position, the breather must replace the closed plug supplied for transportation purposes, prior to putting the gear unit into operation.

Unless otherwise specified, units size F 40 and larger are usually supplied unlubricated at it will be the customer care to fill them with oil prior to putting them into operation.

The charts here after must be referred to as for the mounting position pattern and the corresponding oil plugs, if applicable, and related lubricant quantity.

Values for the oil quantity are indicative with the proper filling always represented by the center of the sight glass or the dipstick, when this is supplied.

In some cases, discrepancies, occasionally also substantial, versus the oil quantities listed in the chart may be noticed.

The "long life" polyglycol-based lubricant supplied by the factory, in the absence of contamination, does not require periodical oil changes throughout the life of the gear unit.

Operation at an ambient temperature $0 < t_a < 50^\circ\text{C}$ is allowed.

Should the gear unit operate at temperature below 0°C , please consult Bonfiglioli Technical Service Dept. for advise.

20 - SCHMIERUNG

Die Schmierung der Getriebe von Bonfiglioli erfolgt durch eine Kombination aus Ölbad- und Tauchschmierung.

Die Getriebegrößen F10, F20 und F30 sind ab Werk mit einer Lebensdauerschmierung versehen.

Wenn diese Baugrößen mit einem IEC-Eingang ausgeliefert werden, dann gehört ein Lüfter zum Lieferumfang, außer bei der Einbaulage V5. Während des Transports wird anstatt des Lüfters ein Stopfen verwendet. Vor dem Einsatz des Getriebes muss dieser Stopfen durch den Lüfter ersetzt werden.

Die Getriebe ab der Größe F 40 werden ohne Ölfüllung ausgeliefert. Vor der Inbetriebnahme muss deshalb auf das Einfüllen der richtigen Ölfüllmenge geachtet werden!

Bitte beachten Sie dazu auch die nachfolgenden Kapitel über die Positionen der Stopfen und Ölschaugläser und den entsprechenden Ölfüllmengen.

Die im Katalog angegebenen Ölfüllmengen sind Anhaltswerte! Maßgebend ist, das der Ölstand bis Mitte des Ölschauglas für die entsprechende Einbaulage aufgefüllt wird.

Auf Abweichungen gegenüber den in der Tabelle angegebenen Ölmengen, gelegentlich nicht unwesentliche, wird hingewiesen.

Die mit Lebensdauerschmierung gelieferten Serien sind mit synthetischem Öl auf Polyglykolbasis gefüllt. Falls dieses Öl nicht verunreinigt wird, ist während der Lebensdauer des Getriebes kein Ölwechsel nötig.

Die zulässige Umgebungstemperatur für den Betrieb liegt im Bereich von $0 < t_a < 50^\circ\text{C}$.

Falls ein Antrieb bei Temperaturen unterhalb von 0° betrieben werden soll, kontaktieren sie bitte unseren technischen Service für weitere Anweisungen.

20 - LUBRIFICATION

Les organes internes des réducteurs Bonfiglioli sont lubrifiés avec un système mixte d'immersion et de battement de l'huile.

Les groupes F10, F20 et F30 sont normalement livrés avec charge de lubrifiant de l'usine, ou du réseau de vente officielle. Pour ces mêmes groupes, dans l'exécution prévue pour motorisation normalisée IEC, un bouchon de reniflard est fourni et devra être installé, sauf position de montage V5, avant la mise en service du réducteur.

Les groupes de grandeur F 40 et supérieur sont normalement fournis sans lubrifiant, et sera par l'utilisateur le remplissage d'huile avant la mise en service. Les tables suivantes sont de référence dans l'interprétation des positions de montage, du placement des bouchons de service et de la quantité de lubrifiant.

Ces dernières sont indicatives, et pour le correct remplissage il faut faire référence au bouchon de niveau ou à la jauge à huile, si présent.

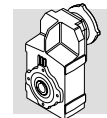
Par rapport à cette condition la quantité de lubrifiant indiquée dans le tableau peut présenter des écarts, occasionnellement considérables.

Le lubrifiant "long life" ; fourni de série est de nature synthétique et, à moins de contamination par l'extérieur, il ne demande pas des remplacements périodiques pour tout l'arc de vie du réducteur. Le même lubrifiant permet fonctionnements à des températures ambiantes $0 < t_a < 50^\circ\text{C}$.

Pour fonctionnement à des températures inférieures consulter notre Service Technique.

(B3)

Tipo di carico / Type of duty Art der Belastung / Type de charge	t_a 0 °C - 20 °C		t_a 20 °C - 40 °C	
	Olio minerale Mineral oil Mineralöl Huile minérale ISO VG	Olio sintetico Synthetic oil Syntheseöl Huile synthétique ISO VG	Olio minerale Mineral oil Mineralöl Huile minérale ISO VG	Olio sintetico Synthetic oil Syntheseöl Huile synthétique ISO VG
Carico leggero / Light duty / Leicht / Charge légère	150	150	220	220
Carico medio / Medium duty / Normal / Charge moyenne	150	150	320	220
Carico pesante / Heavy duty / Schwer / Charge lourde	200	200	460	320



Quantità di lubrificante [l]

Oil quantity [l]

Schmiermittelmenge [l]

Quantité de lubrifiant [l]

(B4)

						
	H1	H2	H3	H4	H5	H6
F 10 2	1.4	1.4	1.4	1.4	1.4	1.4
F 20 2	2.0	2.0	2.0	2.0	2.0	2.0
F 20 3	2.4	2.4	2.4	2.4	2.4	2.4
F 30 2	2.9	2.1	1.5	2.1	2.9	2.9
F 30 3	2.9	2.1	1.5	2.1	2.9	2.9
F 30 4	3.3	2.4	1.7	2.4	3.2	3.3
F 40 2	5.0	3.9	4.0	3.1	5.1	4.0
F 40 3	5.0	3.9	4.0	3.1	5.1	4.0
F 40 4	5.3	4.3	4.3	3.3	5.5	4.4
F 50 2	9.2	6.7	7.6	4.7	9.2	6.7
F 50 3	9.2	6.7	7.6	4.7	9.2	6.7
F 50 4	9.7	7.4	8.1	5.1	9.9	7.4
F 60 3	14	10	7.4	10	14	10
F 60 4	15	12	8.0	11	15	11
F 70 3	23	20	9.7	16	24	19
F 70 4	23	20	9.7	16	27	19
F 80 3	40	34	16	29	42	31
F 80 4	40	34	16	29	48	31
F 90 3	71	59	32	49	76	55
F 90 4	71	59	32	49	86	55

 Lubrificazione a vita

 Life lubricated

 Dauerschmierung

 Lubrification permanente

21- POSIZIONI DI MONTAGGIO E ORIENTAMENTO MORSETTIERA

Gli orientamenti delle morsettiere dei motori sono identificati osservando il motore dal lato ventola; l'orientamento standard è evidenziato in nero (W).

Posizione angolare leva di sblocco freno.

Nei motori autofrenanti, la leva di sblocco freno (se richiesta) ha l'orientamento standard a 90° rispetto alla morsettieria (posizione AB); specificare con relative opzioni qualora l'orientamento desiderato sia diverso.

21 - MOUNTING POSITION AND TERMINAL BOX ORIENTATION

Location of motor terminal box can be specified by viewing the motor from the fan side; standard location is shown in black (W).

Angular position of the brake release lever.

Unless otherwise specified, brake motors have the manual device side located, 90° apart from terminal box. Different angles can be specified through the relevant options available.

21 - EINBAULAGEN UND LAGE DES KLEMMENKASTENS

Die Angaben zur Lage des Klemmenkastens beziehen sich auf das von der Lüfterseite her betrachtete Getriebe. Die Standardorientierung ist schwarz hervorgehoben (W).

Winkellage des Handlüfterhebels.

Bei Bremsmotoren wird der Handlüfterhebel (auf Anfrage) standardmäßig auf 90° gegenüber des Klemmkastens (AB-Anordnung) geliefert; wird eine andere Anordnung verlangt, muß dies bei der Bestellung durch das geeignete Option angegeben werden.

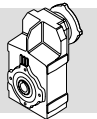
21 - POSITIONS DE MONTAGE ET ORIENTATION BOITE A BORNE

Les orientations des boîtes à bornes des moteurs sont définies en regardant le moteur du côté ventilateur. L'orientation standard est indiquée en noir (W).

Position angulaire levier déblocage frein.

Dans les moteurs freins, ce levier (si requis) aura l'orientation standard de 90° par rapport à la boîte à bornes (position AB); spécifier avec options relatives si l'orientation désirée est différente.

Legenda:	Key:	Zeichenerklärung:	Légende:
 Tappo di sfiato / carico	Filling / breather plug	Einfüll / Ablaßschraube	Bouchon de event / remplissage
 Tappo di livello	Level plug	Ölstandsschraube	Bouchon de niveau
 Tappo di scarico	Drain plug	Ölablaßschraube	Bouchon de vidange



F 10...F 30

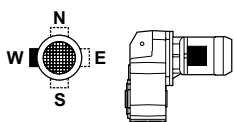
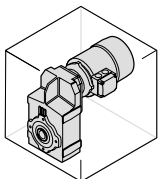
(B5)

HS

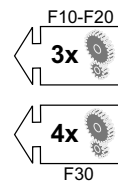
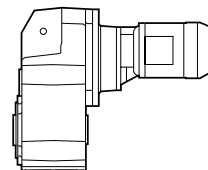
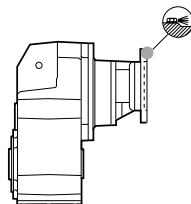
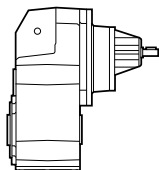
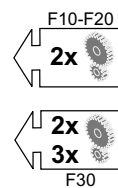
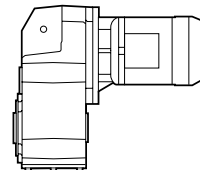
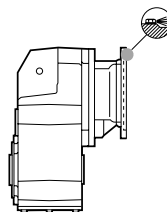
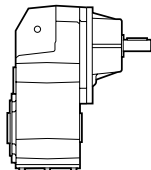
P (IEC)

S

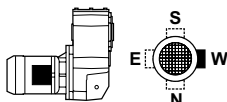
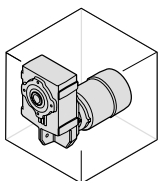
H1



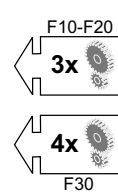
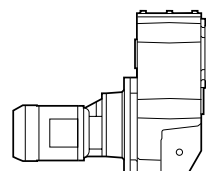
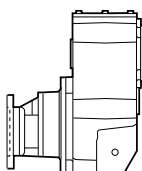
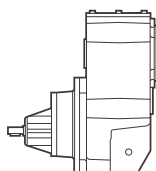
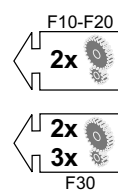
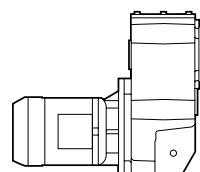
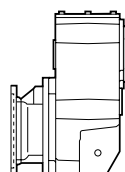
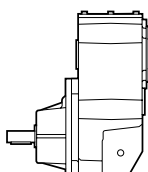
W = Default



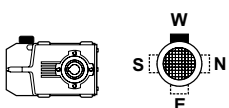
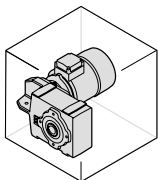
H2



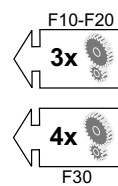
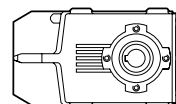
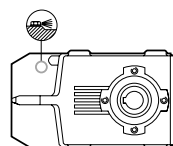
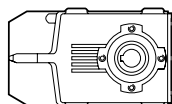
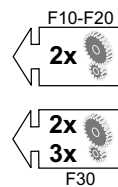
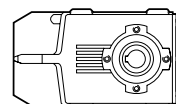
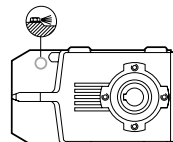
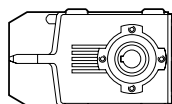
W = Default

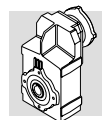


H3



W = Default





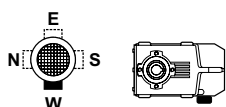
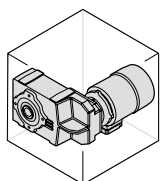
(B6)

HS

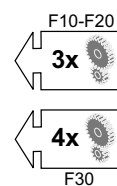
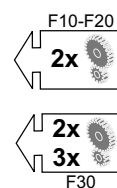
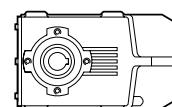
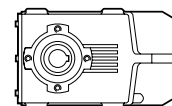
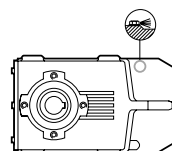
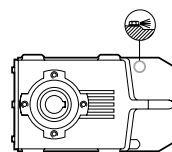
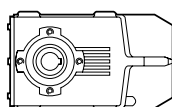
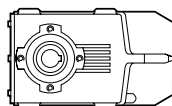
P (IEC)

S

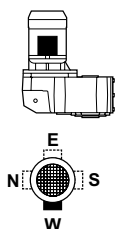
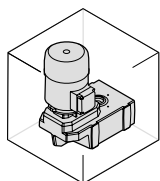
H4



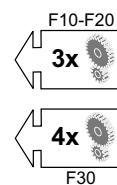
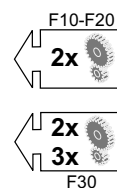
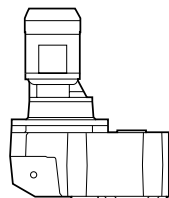
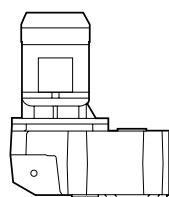
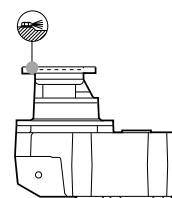
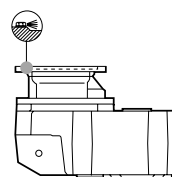
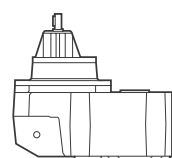
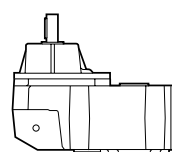
W = Default



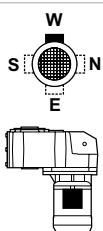
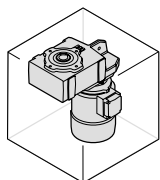
H5



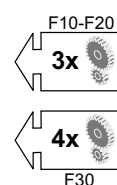
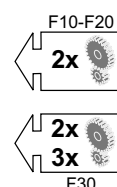
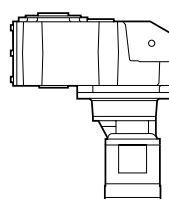
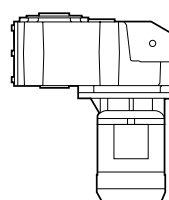
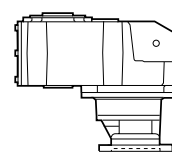
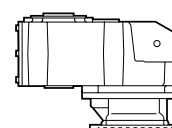
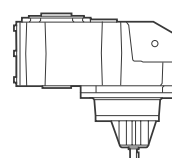
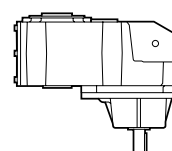
W = Default

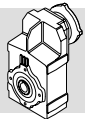


H6



W = Default





F 40...F 60

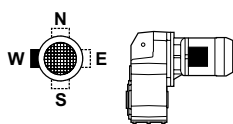
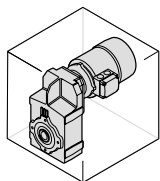
(B7)

HS

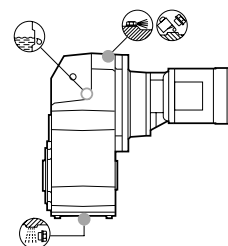
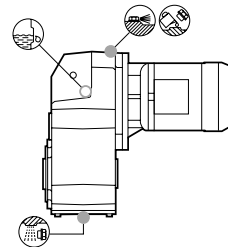
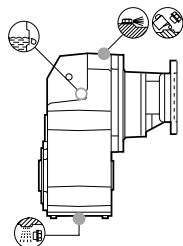
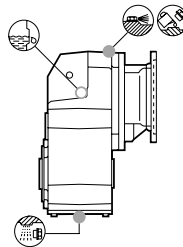
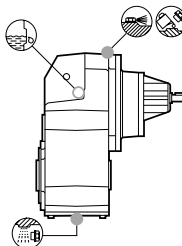
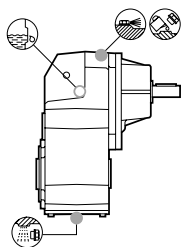
P (IEC)

S

H1



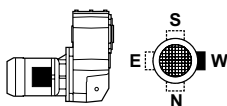
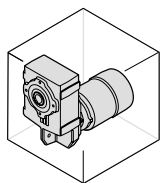
W = Default



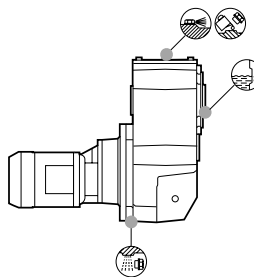
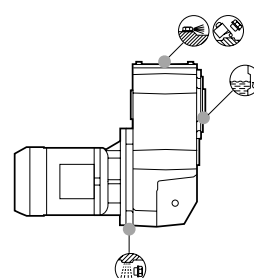
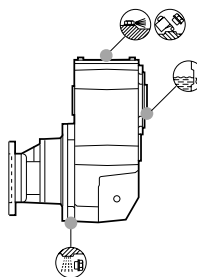
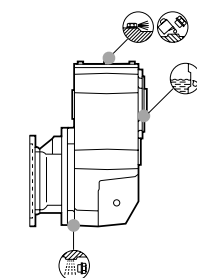
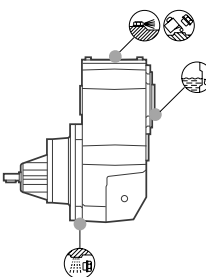
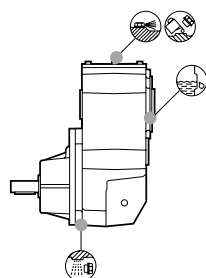
2x
3x

4x

H2



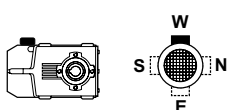
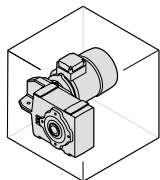
W = Default



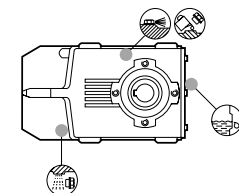
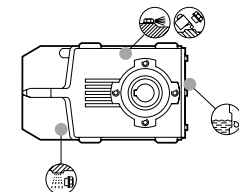
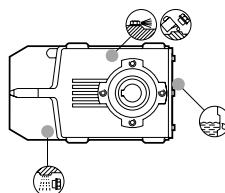
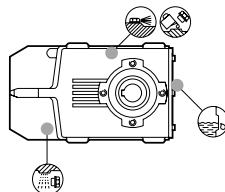
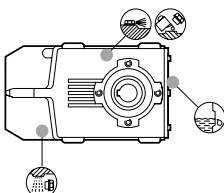
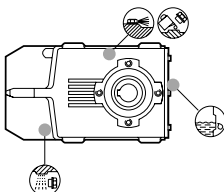
2x
3x

4x

H3

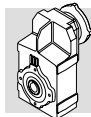


W = Default



2x
3x

4x



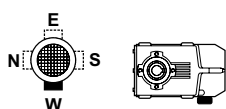
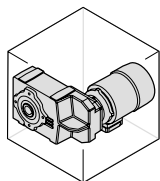
(B8)

HS

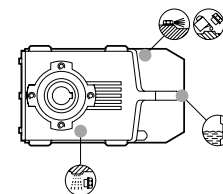
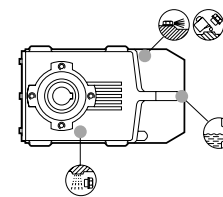
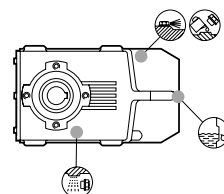
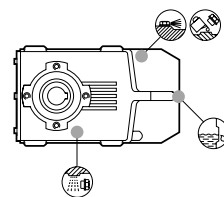
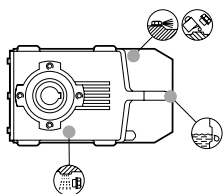
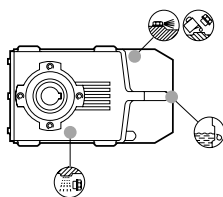
P (IEC)

S

H4



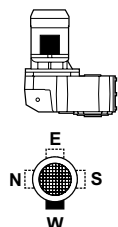
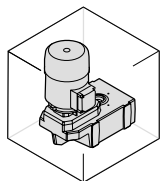
W = Default



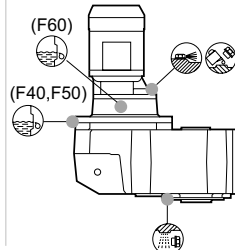
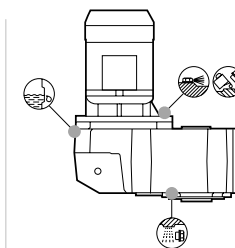
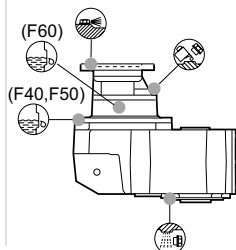
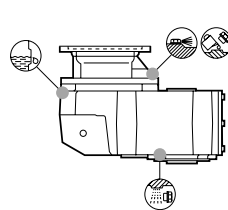
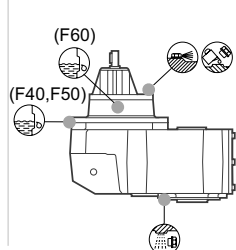
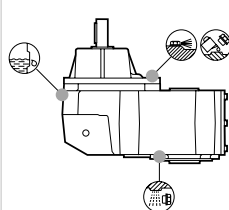
2x
3x

4x

H5



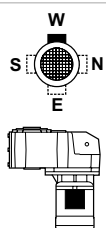
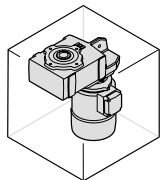
W = Default



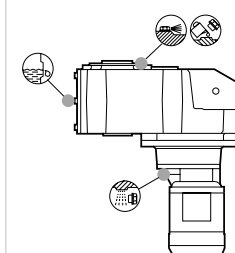
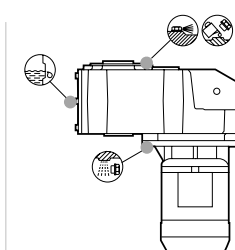
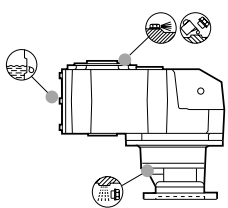
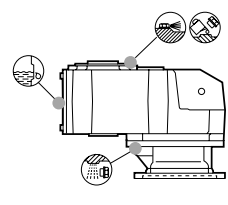
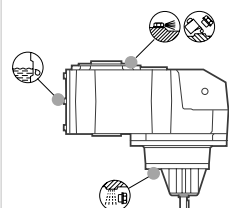
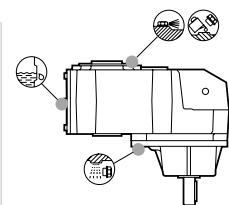
2x
3x

4x

H6

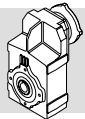


W = Default



2x
3x

4x



F 70...F 90

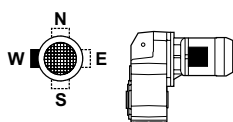
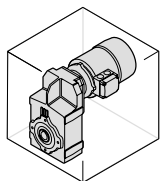
(B9)

HS

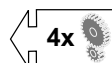
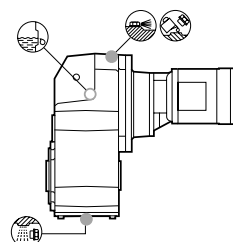
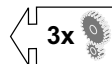
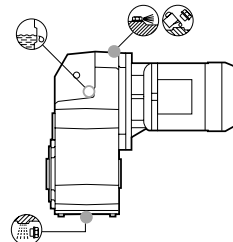
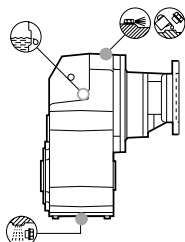
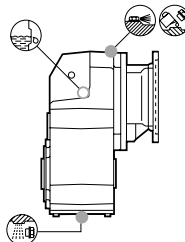
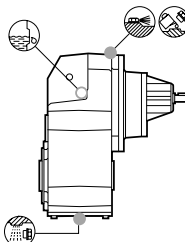
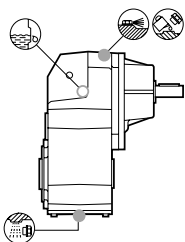
P (IEC)

S

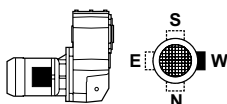
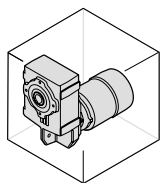
H1



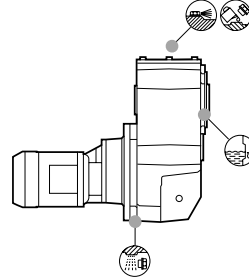
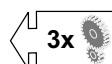
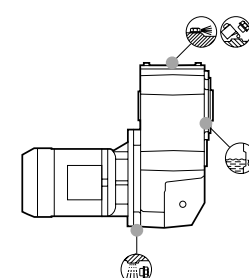
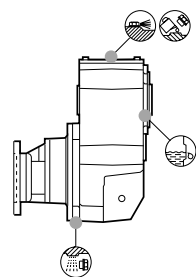
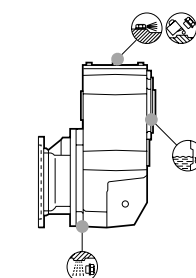
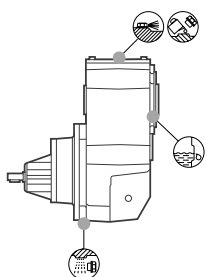
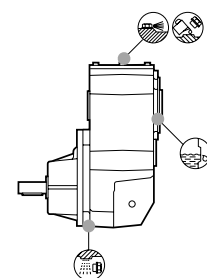
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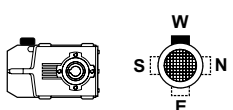
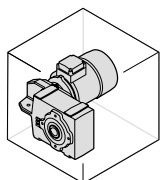
H2



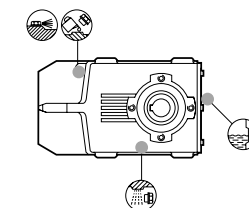
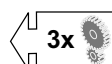
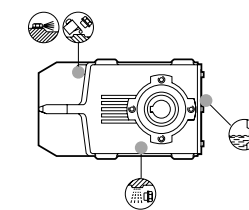
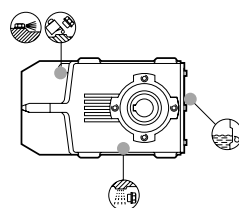
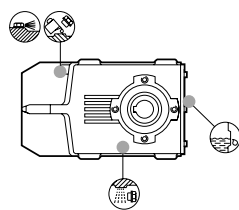
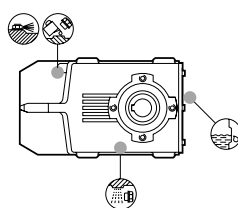
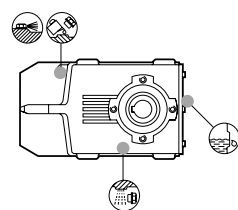
W = Default

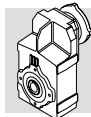


H3



W = Default





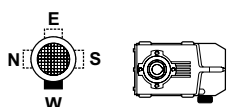
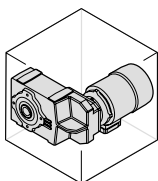
(B10)

HS

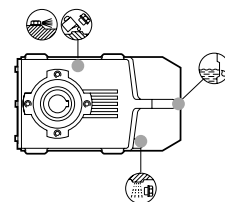
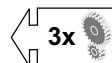
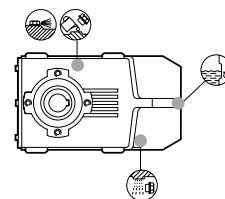
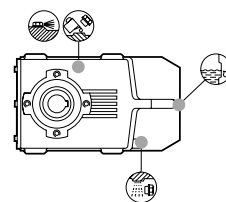
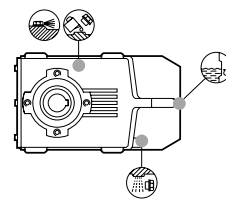
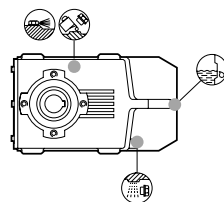
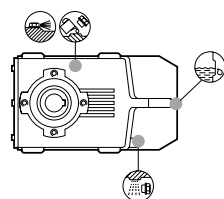
P (IEC)

S

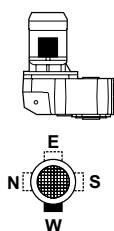
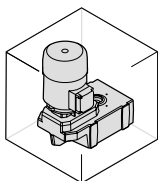
H4



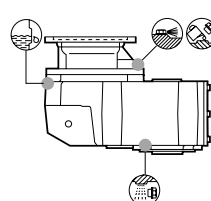
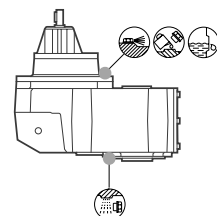
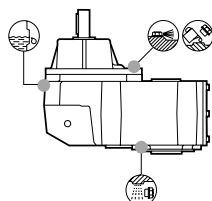
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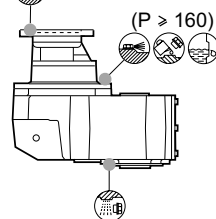
H5



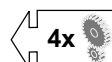
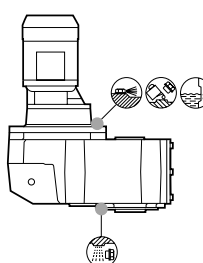
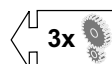
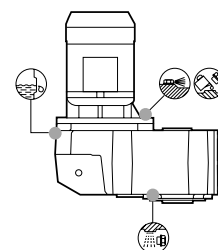
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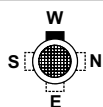
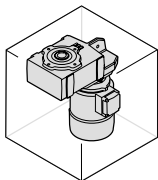
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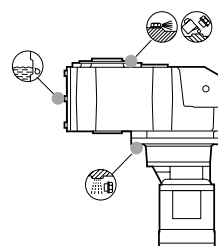
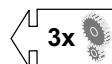
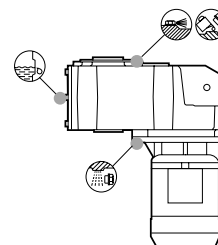
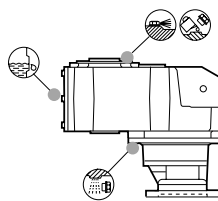
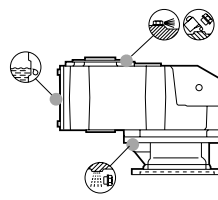
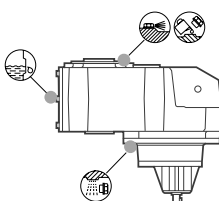
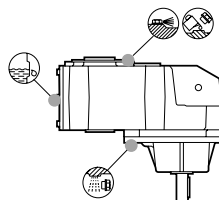
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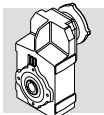


H6



W = Default





22 - CARICHI RADIALI

Organi di trasmissione calettati sugli alberi di ingresso e/o di uscita del riduttore generano forze la cui risultante agisce in senso radiale sull'albero stesso. L'entità di questi carichi deve essere compatibile con la capacità di sopportazione del sistema albero-cuscinetti del riduttore, in particolare il valore assoluto del carico applicato (R_{c1} per albero di ingresso, R_{c2} per albero di uscita) deve essere inferiore al valore nominale (R_{n1} per albero di ingresso, R_{n2} per albero di uscita) riportato nelle tabelle dati tecnici.

Nelle formule che seguono l'indice (1) si riferisce a grandezze relative all'albero veloce, l'indice (2) all'albero lento.

Il carico generato da una trasmissione esterna può essere calcolato, con buona approssimazione, tramite la formula seguente:

22 - OVERHUNG LOADS

External transmissions keyed onto input and/or output shaft generate loads that act radially onto same shaft.

Resulting shaft loading must be compatible with both the bearing and the shaft capacity. Namely shaft loading (R_{c1} for input shaft, R_{c2} for output shaft), must be equal or lower than admissible overhung load capacity for shaft under study (R_{n1} for input shaft, R_{n2} for output shaft). OHL capability listed in the rating chart section.

In the formulas given below, index (1) applies to parameters relating to input shaft, whereas index (2) refers to output shaft.

The load generated by an external transmission can be calculated with close approximation by the following equations:

22 - RADIALKRÄFTE

Die mit den Antriebs- und/oder Abtriebswellen des Getriebes verbundenen Antriebsorgane bilden Kräfte, die in radiale Richtung auf die Welle selbst wirken. Das Ausmaß dieser Kräfte muß mit der Festigkeit des Systems aus Getriebewelle/-lager kompatibel sein, insbesondere muß der absolute Wert der angetragenen Belastung (R_{c1} für Antriebswelle und R_{c2} für Abtriebswelle) unter dem in den Tabellen der Technischen Daten angegebenen Nennwert (R_{n1} für Antriebswelle und R_{n2} für Abtriebswelle) liegen.

In den nachstehenden Formeln bezieht sich die Angabe (1) auf die Maße der Antriebswelle, die Angabe (2) auf die Abtriebswelle.

Die von einem externen Antrieb erzeugte Kraft kann, recht genau, anhand der nachstehenden Formel berechnet werden:

22 - CHARGES RADIALES

Les organes de transmission calés sur les arbres d'entrée et/ou de sortie du réducteur génèrent des forces dont la résultante agit sur l'arbre dans le sens radial.

L'entité de ces charges doit être compatible avec la capacité d'endurance du système arbre-roulements du réducteur. Plus particulièrement, la valeur absolue de la charge appliquée (R_{c1} pour l'arbre d'entrée, R_{c2} pour l'arbre de sortie) doit être inférieure à la valeur nominale (R_{n1} pour l'arbre d'entrée, R_{n2} pour l'arbre de sortie) indiquée dans les tableaux des données techniques.

Dans les formules qui suivent, l'indice (1) se réfère à des tailles relatives à l'arbre rapide, l'indice (2) concerne l'arbre lent. La charge générée par une transmission extérieure peut être calculée, avec une bonne approximation, au moyen de la formule suivante :

$$R_{c1}[N] = \frac{2000 \cdot M_1[Nm] \cdot K_r}{d[mm]} ; R_{c2}[N] = \frac{2000 \cdot M_2[Nm] \cdot K_r}{d[mm]} \quad (16)$$

dove:

$M_{1,2}[Nm]$ = coppia applicata all'albero

$d[mm]$ = diametro primitivo organo calettato

$K_r = 1$ trasmissione con catena

$K_r = 1,25$ trasmissione ad ingranaggio

$K_r = 1,5-2,0$ trasmissione a cinghia

where:

$M_{1,2}[Nm]$ = torque applied to shaft

$d[mm]$ = pitch diameter of part keyed on to shaft

$K_r = 1$ chain transmission

$K_r = 1,25$ gear transmission

$K_r = 1,5-2,0$ belt transmission

dabei:

$M_{1,2}[Nm]$ = Drehmoment an der Welle

$d[mm]$ = Teilkreisdurchmesser des aufgekeilten Organs

$K_r = 1$ Kettenantrieb

$K_r = 1,25$ Zahnradantrieb

$K_r = 1,5-2,0$ Antrieb über Keilriemen

où:

$M_{1,2}[Nm]$ = couple appliqué à l'arbre

$d[mm]$ = diamètre primitif organe calé

$K_r = 1$ transmission avec chaîne

$K_r = 1,25$ transmission à engrenage

$K_r = 1,5-2,0$ transmission à courroie

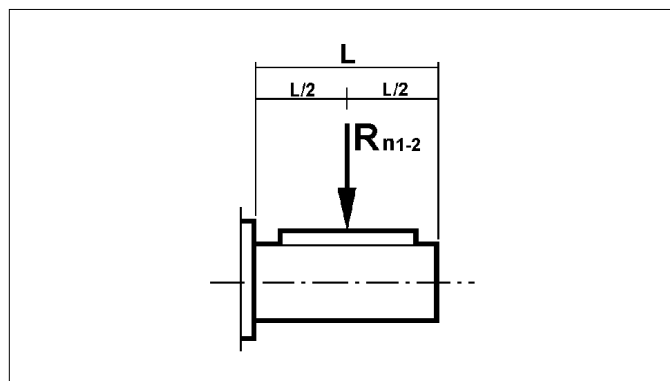
In base al punto di applicazione del carico sull'albero la verifica di compatibilità procederà in modi diversi e in particolare:

Verification of OHL capability varies depending on whether load applies at midpoint of shaft or it is shifted further out:

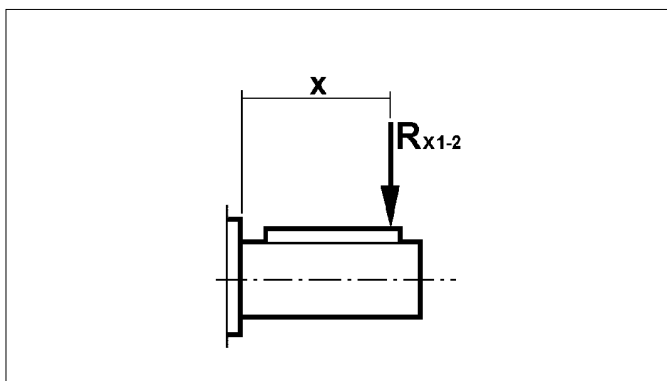
In Abhängigkeit zum Kraftangriffspunkt an der Welle erfolgt die Kontrolle hinsichtlich der Kompatibilität in unterschiedlicher Weise und insbesondere:

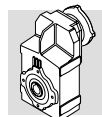
En fonction du point d'application de la charge sur l'arbre, la vérification de la compatibilité sera différente, plus particulièrement:

(B11)



(B12)





a) Applicazione in mezzzeria, tab. (B11)

Il carico precedentemente calcolato si dovrà confrontare con il corrispondente valore nominale esposto a catalogo e dovrà verificarsi:

$$R_{c1} \leq R_{n1} \text{ [albero veloce]}$$

oppure

$$R_{c2} \leq R_{n2} \text{ [albero lento]}$$

a) Load applied at midpoint of shaft, tab.(B11)

A comparison of shaft loading with catalogue OHL ratings should verify the following condition:

$$R_{c1} \leq R_{n1} \text{ [input shaft]}$$

or

$$R_{c2} \leq R_{n2} \text{ [output shaft]}$$

a) Kraftangriffspunkt in der Mitte, Tab. (B11)

Der zuvor errechnete Wert muß mit dem im Katalog angegebenen Nennwert verglichen werden. Es muß sich folgendes ergeben:

$$R_{c1} \leq R_{n1} \text{ [Antriebswelle]}$$

oder

$$R_{c2} \leq R_{n2} \text{ [Abtriebswelle]}$$

a) Application au milieu, tab. (B11)

La charge précédemment calculée doit être comparée avec la valeur nominale correspondante indiquée dans le catalogue, on doit vérifier :

$$R_{c1} \leq R_{n1} \text{ [arbre rapide]}$$

ou

$$R_{c2} \leq R_{n2} \text{ [arbre lent]}$$

b) Applicazione spostata dalla mezzzeria, tab. (B12)

L'applicazione del carico ad una distanza "x" dalla battuta dell'albero comporta il ricalcolo del valore ammissibile a detta distanza.

Il nuovo valore è individuato con i simboli R_{x1} (ingresso) e R_{x2} (uscita) e si ricava dai valori di catalogo, rispettivamente R_{n1} e R_{n2} , tramite l'elaborazione del fattore:

b) Load off the midpoint tab. (B12)

When load is shifted at an "x" distance from shaft shoulder, permissible load must be calculated for that distance.

Revised permissible overhung loads R_{x1} (input) and R_{x2} (output) are calculated respectively from original rated values R_{n1} and R_{n2} through factor:

b) Von der Mitte versetzter Kraftangriffspunkt Tab. (B12)

Der auf einer Distanz "x" vom Wellenansatz liegende Kraftangriffspunkt fordert eine erneute Berechnung des für diesen Abstand zulässigen Werts.

Der neue Wert wird mit den Symbolen R_{x1} (Antrieb) und R_{x2} (Abtrieb) gekennzeichnet und unter Anwendung der nachstehenden Faktorenberechnung aus den Katalogwerten R_{n1} und R_{n2} :

b) Application déplacée du milieu, tab. (B12)

L'application de la charge à une distance "x" de la butée de l'arbre implique un nouveau calcul de la valeur admissible à cette distance.

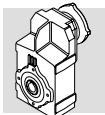
La nouvelle valeur est indiquée par les symboles R_{x1} (entrée) et R_{x2} (sortie) ou peut être calculée d'après les valeurs de catalogue, respectivement R_{n1} et R_{n2} , en élaborant le facteur :

$$\frac{a}{b+x}$$

(17)

(B13)

	Costanti del riduttore / Load location factors / Getriebekonstanten / Constantes du réducteur					
	Albero lento / Output shaft Abtriebswelle / Arbre lent			Albero veloce / Input shaft Antriebswelle / Arbre rapide		
	a	b	c	a	b	c
F 10 2	123	100.5	450	21	1	300
F 20 2	145	115	600	40	20	350
F 20 3	145	115	600	21	1	300
F 30 2 - F 30 3	165	135	850	38.5	18.5	350
F 30 4	165	135	850	21	1	300
F 40 2 - F 40 3	191.5	151.5	1000	49.5	24.5	450
F 40 4	191.5	151.5	1000	40	20	350
F 50 2 - F 50 3	233.5	183.5	1300	49.5	24.5	450
F 50 4	233.5	183.5	1300	38.5	18.5	350
F 60 3	258.5	198.5	1100	55.5	25.5	600
F 60 4	258.5	198.5	1100	49.5	24.5	450
F 70 3	342	277	1600	86	31	1000
F 70 4	342	277	1600	49.5	24.5	450
F 80 3	386.5	301.5	1800	86	31	1000
F 80 4	386.5	301.5	1800	49.5	24.5	450
F 90 3	458.5	353.5	2400	116	46	1400
F 90 4	458.5	353.5	2400	49.5	24.5	450



La procedura di verifica comporta passi successivi che sono qui descritti.

Verification procedure is described here after.

Das Kontrollverfahren zieht die nachstehend beschriebenen Schritte nach sich.

La procédure de vérification comporte les pas successifs indiqués ici.

ALBERO VELOCE

INPUT SHAFT

ANTRIEBSWELLE

ARBRE RAPIDE

1. Calcolo di:

1. Calculate:

1. Berechnung von:

1. Calcul de:

$$R_{x1} = R_{n1} \cdot \frac{a}{b+x} \quad (18)$$

N.B. A condizione che:

N.B. Subject to condition:

HINWEIS unter der Bedingung, daß:

N.B. A condition que :

$$\frac{L}{2} \leq x \leq c \quad (19)$$

Infine si dovrà verificare che:

Finally, the following condition must be verified:

Dies als Voraussetzung, muß sich folgendes ergeben:

Ensuite, vérifier que :

$$R_{c1} \leq R_{x1} \quad (20)$$

ALBERO LENTO

OUTPUT SHAFT

ABTRIEBSWELLE

ARBRE LENT

1. Calcolo di:

1. Calculate:

1. Berechnung von:

1. Calcul de :

$$R_{x2} = R_{n2} \cdot \frac{a}{b+x} \quad (21)$$

N.B. A condizione che:

N.B. Subject to condition:

HINWEIS unter der Bedingung, daß:

N.B. A condition que :

$$\frac{L}{2} \leq x \leq c \quad (22)$$

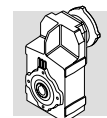
Infine si dovrà verificare che:

Finally, the following condition must be verified:

Dies als Voraussetzung, muß sich folgendes ergeben:

Ensuite, vérifier que :

$$R_{c2} \leq R_{x2} \quad (23)$$



23 - CARICHI ASSIALI, A_{n1} , A_{n2}

I valori di carico assiale ammissibile sugli alberi veloce $[A_{n1}]$ e lento $[A_{n2}]$ si possono ricavare con riferimento al corrispondente valore di carico radiale $[R_{n1}]$ e $[R_{n2}]$ tramite le espressioni che seguono:

23 - THRUST LOADS, A_{n1} , A_{n2}

Permissible thrust loads on input $[A_{n1}]$ and output $[A_{n2}]$ shafts are obtained from the radial loading for the shaft under consideration $[R_{n1}]$ and $[R_{n2}]$ through the following equation:

23 - AXIALKRÄFTE, A_{n1} , A_{n2}

Die Werte der zulässigen, auf die Antriebswelle $[A_{n1}]$ und auf die Abtriebswelle $[A_{n2}]$ einwirkenden Axialkräfte können unter Bezugnahme auf den jeweiligen Wert der Radialkraft $[R_{n1}]$ und $[R_{n2}]$ anhand der nachstehenden Angaben berechnet werden:

23 - CHARGES AXIALES, A_{n1} , A_{n2}

Les valeurs de charge axiale admissible sur les arbres rapides $[A_{n1}]$ et lent $[A_{n2}]$ peuvent être calculées, en se référant à la valeur de charge radiale correspondante $[R_{n1}]$ et $[R_{n2}]$ au moyen des formules suivantes :

$$A_{n1} = R_{n1} \cdot 0,2$$

$$A_{n2} = R_{n2} \cdot 0,2$$

(24)

I valori di carico assiale ammissibile così calcolati si riferiscono al caso di forze assiali agenti contemporaneamente ai carichi radiali nominali.

Nel solo caso in cui il valore del carico radiale agente sull'albero del riduttore sia nullo, si può considerare il carico assiale ammissibile $[A_n]$ pari al 50% del valore di carico radiale ammissibile $[R_n]$ sullo stesso albero. In presenza di carichi assiali eccedenti il valore ammissibile, o di forze assiali fortemente prevalenti sui carichi radiali, è consigliabile contattare il Servizio Tecnico di Bonfiglioli Riduttori per una verifica puntuale.

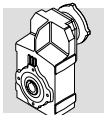
The thrust loads calculated through these formulas apply to thrust forces occurring at the same time as rated radial loads. In the only case that no overhung load acts on the shaft the value of the admissible thrust load $[A_n]$ amounts to 50% of rated OHL $[R_n]$ on same shaft. Where thrust loads exceed permissible value or largely prevail over radial loads, contact Bonfiglioli Riduttori for an in-depth analysis of the application.

Die so errechneten Werte der zulässigen Axialkräfte beziehen sich auf den Fall, in dem die Axialkräfte gleichzeitig mit den Nennradialkräften einwirken. Nur im Fall, es keine Radialbelastung auf die Getriebewelle gibt, ist der Wert der zulässigen Axialbelastung $[A_n]$ gleich zu 50% der zulässigen Radialbelastung $[R_n]$ auf die gleiche Welle. In Anwesenheit von übermäßigen Axialkräften, oder stark auf die Radialkräfte einwirkende Kräfte, wird im Hinblick auf eine genaue Kontrolle empfohlen, sich mit dem Technischen Kundendienst der Bonfiglioli Riduttori in Verbindung zu setzen.

Les valeurs de charge axiale admissible ainsi calculées se réfèrent au cas de forces axiales agissant en même temps que les charges radiales nominales.

Dans le seul cas la valeur de la charge radiale agissant sur l'arbre soit nul, l'on peut considérer la charge axiale admissible $[A_n]$ égale à 50% de la valeur de la charge radiale admissible $[R_n]$ sur le même arbre.

En présence de charges axiales excédant la valeur admissible, ou de forces axiales fortement supérieures aux charges radiales, il est conseillé de contacter le Service Technique Bonfiglioli Riduttori pour une vérification.



24 - DISPOSITIVO ANTIRETRO 24 - ANTI-RUN BACK DEVICE 24 - RÜCKLAUFSPERRE 24 - DISPOSITIF ANTIRETOUR

A richiesta si può fornire il riduttore /motoriduttore munito di dispositivo antiretro che permette la rotazione dell'albero lento solo nel senso desiderato (opzione AL-AR).

La tabella (B14) indica i riduttori nei quali è possibile applicare il dispositivo antiretro.

In fase d'ordine specificare il senso di rotazione mediante le opzioni AL o AR (tabella B15) nella designazione riduttore o in quella del motore.

Se non specificato, il riduttore viene fornito con il senso di rotazione AR.

An anti-run back device is available upon request to allow rotation of the output shaft in one direction only (option AL-AR).

Table B14 shows the gear-boxes in which the anti-run back device can be installed.

When ordering the gear unit, the direction of free rotation must be specified through either the AR or the AL option.

Unless otherwise specified, the AR direction of rotation is arranged at the factory as the backstop default setting.

Die Getriebe können mit einer Rücklaufsperrung geliefert werden, um die Drehung der Abtriebswelle in einer Richtung zu ermöglichen (Option AL-AR).

Auf der Tabelle B14 sind die Getriebe angegeben, mit denen die Rücklaufsperrung verwendet werden kann.

Bei Bestellung bitte die gewünschte Drehrichtung durch die Option AL oder AR (Tabelle B15) in den Getriebe oder Motorbezeichnung angeben. Wenn nicht angegeben, wird das Getriebe mit Drehrichtung AR geliefert.

Sur demande le réducteur/motoréducteur peut être fourni avec le dispositif anti-retour en permettant la rotation de l'arbre lent seulement dans un sens (option AL-AR).

Le tableau B14 indique les réducteurs dans les quels on peut appliquer le dispositif anti-retour.

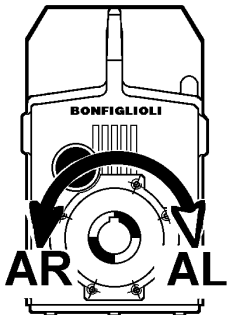
A la commande on (tab. B15) doit préciser le sens de rotation en indiquant les options AL ou AR dans la désignation du réducteur ou du moteur. En cas contraire le réducteur sera livré avec sens de rotations AR.

(B14)

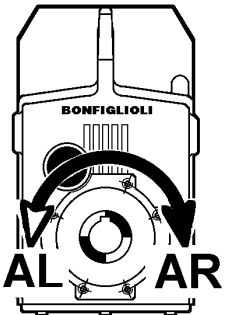
F 10 2	F 20 2 F 20 3	F 30 2 F 30 3 F 30 4	F 40 2 F 40 3 F 40 4	F 50 2	F 50 3 F 50 4	F 60 3 F 60 4	F 70 3 F 70 4	F 80 3 F 80 4	F 90 3 F 90 4
•	•	•	•	•					

- Applicazione antiretro possibile solo sul motore integrato / *Anti-run back device can be fitted to compact motor only*
Die Rücklaufsperrung kann nur am integrierten Motor angebracht werden / *Application du dispositif anti-retour possible uniquement sur le moteur intégré*
- Applicazione antiretro possibile sia sul riduttore che sul motoriduttore integrato / *Anti-run back device can be fitted both to compact motor and speed reducer*
Die Rücklaufsperrung kann sowohl am a Getriebe als auch am Motor angebracht werden / *Application dispositif anti-retour possible aussi bien sur le réducteur que sur le moteur intégré.*

(B15)



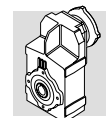
AR



AL

F 10 2 - F 20 2 - F 30 2 - F 40 2 - F 50 2
F 30 4 - F 40 4 - F 50 4 - F 60 4
F 70 4 - F 80 4 - F 90 4

F 20 3 - F 30 3 - F 40 3 - F 50 3 - F 60 3
F 70 3 - F 80 3 - F 90 3



25 - OPZIONI E ALTERNATIVE

25 - OPTIONS AND SPECIAL VERSIONS

25 - OPTIONALS UND ALTERNATIVLÖSUNGEN

25 - OPTIONS ET VARIANTES

Spianatura laterale (Opzione FL)

A richiesta si può fornire il riduttore/motoriduttore con i piani laterali spianati e forati per consentire il fissaggio (opzione FL). La tabella (B16) riporta le dimensioni dei fori e i relativi interassi (Sui riduttori F 70, F 80 e F 90 spianature e forature sono di serie).

Side flats (FL Option)

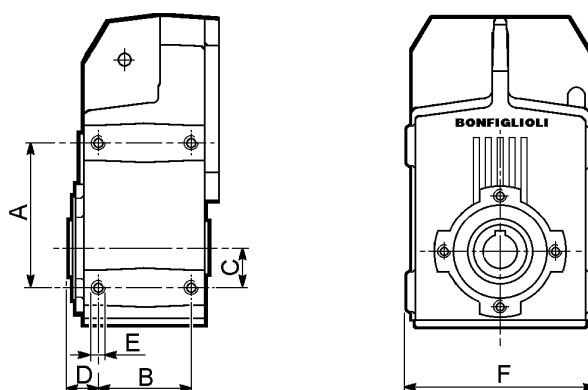
F gear units can be side machined and tapped by specifying the FL option. Mounting dimensions relevant to the FL option are given in the chart (B16) here after. Gear units type F 70, F 80 and F 90 are side machined and tapped as standard.

Seitlicher planschnitt (Option FL)

Auf Anfrage kann das Getriebe bzw. der Getriebemotor mit seitlichen Flächen geliefert werden, die einem Planschnitt unterzogen wurden und mit Bohrungen ausgestattet sind, die eine entsprechende Befestigung ermöglichen (Option FL). In der Tabelle (B16) werden die Bohrungsgrößen und die betreffenden Achsstände angegeben (An den Getrieben F 70, F 80 und F 90 gehören die Verstärkungen und die Bohrungen zur Serienausstattung).

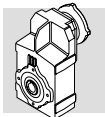
Surfacage lateral (Option FL)

Sur demande on peut recevoir le réducteur/motoreducteur avec ses faces latérales surfacées et percées pour en permettre l'assemblage (option FL). Le tableau (B16) comporte les dimensions des trous et les entraxes correspondants (Les percements et les planages sont standard sur les réducteurs F 70, F 80 et F 90).



(B16)

	A	B	C	D	E	F
F 10	115	60	35	21.25	M8x16	163
F 20	130	70	40	26.5	M10x20	181
F 30	147	80	45	30	M12x20	193
F 40	190	95	60	32.5	M12x22	223
F 50	240	110	70	35	M14x26	273
F 60	260	140	70	39.5	M16x30	298



Albero lento alternativo

L'albero lento cavo di tutti i riduttori serie F può essere fornito con un diametro alternativo allo standard le cui dimensioni sono riportate nella tabella (B17).

Optional output shaft bore

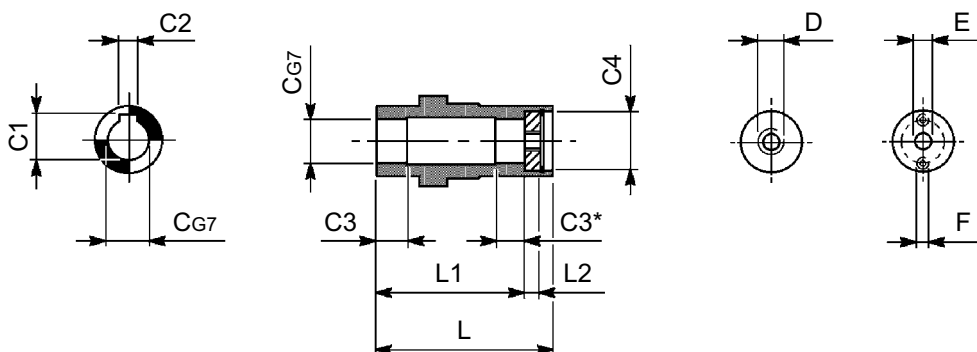
As an option, all gear units of the F series offer an alternative bore for the hollow output shaft. Relevant dimensions are listed in the chart (B17) here after.

Alternative Hohlwelle

Die Abtriebshohlwelle alle Untersetzungsgetriebe der Serie F kann auch mit einem alternativen Durchmesser, dessen Maße in der Tabelle (B14) angegeben sind, geliefert werden.

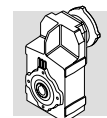
Arbre de sortie alternatif

L'arbre de sortie creux de tous les réducteurs série F peut être livré avec un diamètre différent du standard, dont les dimensions sont reprises dans le tableau (B17).



(B17)

	C	C1	C2	C3	C4	L	L1	L2	D	E	F
F 10	30	33.3	8	18/15*	38	100.5	88.5	6	M10	—	—
F 20	35	38.3	10	20	42	120	101	10.3	M10	—	—
F 30	40	43.3	12	30	42	125	106	10.5	M10	—	—
F 40	45	48.8	14	30	50	144	120.5	12.5	M12	—	—
F 50	55	59.3	16	35	60	163	141	14.5	M16	—	—
F 60	70	74.9	20	40	70	204	182	14.5	—	17	M12
F 70	70	74.9	20	60	85	261	231	17	—	22	M16
F 80	80	85.4	22	80	95	309	274	18.5	—	22	M16
F 90	90	95.5	25	90	110	367.5	335.5	21	—	26	M16



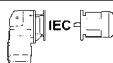
**26 - DATI TECNICI
MOTORIDUTTORI**

**26 - GEARMOTOR RATING
CHARTS**

**26 - GETRIEBEMOTOREN-
AUSWAHLTABELLEN**

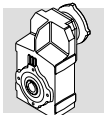
**26 - DONNEES TECHNIQUES
MOTOREDUCTEURS**

0.09 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
0.40	1945	2.6	2188	35000	F404_982.4 S05 M05A6	95	F704_2188 P63 BN63A6	108
0.50	1526	3.4	1717	35000			F704_1717 P63 BN63A6	108
0.61	1279	1.3	1439	12000			F504_1439 P63 BN63A6	100
0.75	1038	1.5	1168	12000			F504_1168 P63 BN63A6	100
0.90	873	1.1	982.4	8500			F404_982.4 P63 BN63A6	96
0.90	870	1.8	979.4	12000	F404_813.8 S05 M05A6 F404_690.1 S05 M05A6	95	F504_979.4 P63 BN63A6	100
1.1	735	2.2	826.4	12000			F504_826.4 P63 BN63A6	100
1.1	723	1.3	813.8	8500			F404_813.8 P63 BN63A6	96
1.3	613	1.5	690.1	8500			F404_690.1 P63 BN63A6	96
1.3	601	2.7	676.3	12000			F504_676.3 P63 BN63A6	100
1.5	514	1.1	578.6	6500	F304_578.6 S05 M05A6 F304_462.6 S05 M05A6	91	F304_578.6 P63 BN63A6	92
1.9	411	1.3	462.6	6500			F304_462.6 P63 BN63A6	92
2.4	329	1.7	374.4	6500	F203_255.3 S05 M05A6	87	F303_374.4 P63 BN63A6	92
3.1	258	2.1	293.8	6500			F303_293.8 P63 BN63A6	92
3.4	227	1.1	255.3	4000			F203_255.3 P63 BN63A6	88
3.6	223	2.5	253.6	6500			F303_253.6 P63 BN63A6	92
4.2	186	1.3	209.3	4000			F203_209.3 P63 BN63A6	88
5.1	153	1.6	172.6	4000	F203_172.6 S05 M05A6	87	F203_172.6 P63 BN63A6	88
6.9	119	2.1	132.2	4000	F202_132.2 S05 M05A6	87	F202_132.2 P63 BN63A6	88
7.2	114	1.2	127.1	2800	F102_127.1 S05 M05A6	83	F102_127.1 P63 BN63A6	84
8.0	103	2.4	114.3	4000	F202_114.3 S05 M05A6	87	F202_114.3 P63 BN63A6	88
8.6	95	1.5	106.0	2800	F102_106.0 S05 M05A6	83	F102_106.0 P63 BN63A6	84
9.9	82	1.7	91.5	2800	F102_91.5 S05 M05A6	83	F102_91.5 P63 BN63A6	84
10.1	81	3.1	90.4	4000	F202_90.4 S05 M05A6	87	F202_90.4 P63 BN63A6	88
12.8	64	2.2	71.1	2800	F102_71.1 S05 M05A6	83	F102_71.1 P63 BN63A6	84
14.4	57	2.5	63.0	2800	F102_63.0 S05 M05A6	83	F102_63.0 P63 BN63A6	88
18.7	44	3.2	48.7	2800	F102_48.7 S05 M05A6	83	F102_48.7 P63 BN63A6	84
23.0	36	3.9	39.6	2800	F102_39.6 S05 M05A6	83	F102_39.6 P63 BN63A6	84
27.6	30	4.7	33.0	2800	F102_33.0 S05 M05A6	83	F102_33.0 P63 BN63A6	84
35	23	6.1	25.8	2800	F102_25.8 S05 M05A6	83	F102_25.8 P63 BN63A6	84
47	17	8.1	19.3	2800	F102_19.3 S05 M05A6	83	F102_19.3 P63 BN63A6	84
62	13	1 0.5	14.6	2700	F102_14.6 S05 M05A6	83	F102_14.6 P63 BN63A6	84
70	12	1 0.6	13.0	2600	F102_13.0 S05 M05A6	83	F102_13.0 P63 BN63A6	84

0.12 kW

0.40	2623	1.9	2188	35000	F404_1213 S05 M05A4	95	F704_2188 P63 BN63B6	108
0.51	2058	2.5	1717	35000			F704_1717 P63 BN63B6	108
0.60	1742	2.9	2188	35000			F704_2188 P63 BN63A4	108
0.65	1607	3.1	2019	35000			F704_2019 P63 BN63A4	108
0.74	1400	1.1	1168	12000			F504_1168 P63 BN63B6	100
0.76	1368	2.1	1141	20000	F404_982.4 S05 M05A4	95	F604_1141 P63 BN63B6	104
0.91	1149	2.5	958.9	20000			F604_958.9 P63 BN63B6	104
0.91	1146	1.4	1439	12000			F504_1439 P63 BN63A4	100
1.1	991	1.6	826.4	12000			F504_826.4 P63 BN63B6	100
1.1	966	1.0	1213	8500			F404_1213 P63 BN63A4	96
1.1	930	1.7	1168	12000	F404_813.8 S05 M05A4 F404_690.1 S05 M05A4 F304_685.6 S05 M05A4	95	F504_1168 P63 BN63A4	100
1.3	782	1.2	982.4	8500			F404_982.4 P63 BN63A4	96
1.3	780	2.1	979.4	12000			F504_979.4 P63 BN63A4	100
1.6	658	2.4	826.4	12000			F504_826.4 P63 BN63A4	100
1.6	648	1.5	813.8	8500			F404_813.8 P63 BN63A4	96
1.9	549	1.7	690.1	8500	F304_578.6 S05 M05A4 F404_549.8 S05 M05A4	95	F404_690.1 P63 BN63A4	96
1.9	546	1.0	685.6	6500			F304_685.6 P63 BN63A4	92
1.9	538	3.0	676.3	12000	F304_462.6 S05 M05A4 F404_433.7 S05 M05A4	91	F504_676.3 P63 BN63A4	100
2.3	461	1.2	578.6	6500			F304_578.6 P63 BN63A4	92
2.4	438	2.2	549.8	8500	F203_316.9 S05 M05A4	87	F404_549.8 P63 BN63A4	96
2.8	368	1.5	462.6	6500			F304_462.6 P63 BN63A4	92
3.0	345	2.8	433.7	8500	F203_255.3 S05 M05A4	87	F404_433.7 P63 BN63A4	96
3.7	285	1.9	374.4	6500			F303_374.4 P63 BN63A4	92
4.1	252	1.0	316.9	4000	F203_255.3 S05 M05A4	87	F203_316.9 P63 BN63A4	88
4.8	224	2.5	293.8	6500			F303_293.8 P63 BN63A4	92
5.1	203	1.2	255.3	4000			F203_255.3 P63 BN63A4	88

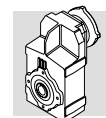


0.12 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
5.5	193	2.8	253.6	6500			F303_253.6 P63 BN63A4	92
6.3	167	1.5	209.3	4000	F203_209.3 S05 M05A4	87	F203_209.3 P63 BN63A4	88
6.9	158	1.6	132.2	4000	F202_132.2 S05 M05B6	87	F202_132.2 P63 BN63B6	88
7.2	152	0.9	127.1	2800	F102_127.1 S05 M05B6	83	F102_127.1 P63 BN63B6	84
7.6	137	1.8	172.6	4000	F203_172.6 S05 M05A4	87	F203_172.6 P63 BN63A4	88
8.0	137	1.8	114.3	4000	F202_114.3 S05 M05B6	87	F202_114.3 P63 BN63B6	88
8.6	127	1.1	106.0	2800	F102_106.0 S05 M05B6	83	F102_106.0 P63 BN63B6	84
9.9	109	1.3	91.5	2800	F102_91.5 S05 M05B6	83	F102_91.5 P63 BN63B6	84
10.6	103	2.4	132.2	4000	F202_132.2 S05 M05A4	87	F202_132.2 P63 BN63A4	88
11.0	99	1.4	127.1	2800	F102_127.1 S05 M05A4	83	F102_127.1 P63 BN63A4	84
12.2	89	2.8	114.3	4000	F202_114.3 S05 M05A4	87	F202_114.3 P63 BN63A4	88
13.2	82	1.7	106.0	2800	F102_106.0 S05 M05A4	83	F102_106.0 P63 BN63A4	84
14.4	75	1.9	63.0	2800	F102_63.0 S05 M05B6	83	F102_63.0 P63 BN63B6	84
14.7	74	3.4	61.9	4000	F202_61.9 S05 M05B6	87	F202_61.9 P63 BN63B6	88
15.3	71	2.0	91.5	2800	F102_91.5 S05 M05A4	83	F102_91.5 P63 BN63A4	84
15.5	70	3.6	90.4	4000	F202_90.4 S05 M05A4	87	F202_90.4 P63 BN63A4	88
19.7	55	2.5	71.1	2800	F102_71.1 S05 M05A4	83	F102_71.1 P63 BN63A4	84
22.2	49	2.9	63.0	2800	F102_63.0 S05 M05A4	83	F102_63.0 P63 BN63A4	84
28.7	38	3.7	48.7	2800	F102_48.7 S05 M05A4	83	F102_48.7 P63 BN63A4	84
35	31	4.5	39.6	2800	F102_39.6 S05 M05A4	83	F102_39.6 P63 BN63A4	84
42	26	5.5	33.0	2800	F102_33.0 S05 M05A4	83	F102_33.0 P63 BN63A4	84
54	20	7.0	25.8	2800	F102_25.8 S05 M05A4	83	F102_25.8 P63 BN63A4	84
72	15	9.0	19.3	2560	F102_19.3 S05 M05A4	83	F102_19.3 P63 BN63A4	84
96	11	1 0.4	14.6	2340	F102_14.6 S05 M05A4	83	F102_14.6 P63 BN63A4	84
107	10	1 0.3	13.0	2250	F102_13.0 S05 M05A4	83	F102_13.0 P63 BN63A4	84

0.18 kW

0.41	3803	1.3	2188	35000	F704_2188 S1 M1SC6	107	F704_2188 P71 BN71A6	108
0.45	3454	2.3	1987	45000	F804_1987 S1 M1SC6	111	F804_1987 P71 BN71A6	112
0.60	2593	1.9	2188	35000			F704_2188 P63 BN63B4	108
0.77	2035	2.5	1717	35000			F704_1717 P63 BN63B4	108
0.79	1983	1.5	1141	20000	F604_1141 S1 M1SC6	103	F604_1141 P71 BN71A6	104
0.89	1755	2.8	1481	35000			F704_1481 P63 BN63B4	108
0.94	1667	1.7	958.9	20000	F604_958.9 S1 M1SC6	103	F604_958.9 P71 BN71A6	104
1.1	1384	1.2	1168	12000			F504_1168 P63 BN63B4	100
1.2	1352	2.1	1141	20000			F604_1141 P63 BN63B4	104
1.3	1161	1.4	979.4	12000			F504_979.4 P63 BN63B4	100
1.4	1136	2.6	958.9	20000			F604_958.9 P63 BN63B4	104
1.6	979	1.6	826.4	12000			F504_826.4 P63 BN63B4	100
1.6	971	3.0	819.0	20000			F604_819.0 P63 BN63B4	104
1.6	964	1.0	813.8	8500	F404_813.8 S05 M05B4	95	F404_813.8 P63 BN63B4	96
1.9	818	1.2	690.1	8500	F404_690.1 S05 M05B4	95	F404_690.1 P63 BN63B4	96
2.0	801	2.0	676.3	12000			F504_676.3 P63 BN63B4	100
2.4	652	1.5	549.8	8500	F404_549.8 S05 M05B4	95	F404_549.8 P63 BN63B4	96
2.5	629	2.5	530.5	12000			F504_530.5 P63 BN63B4	100
2.9	548	1.0	462.6	6500	F304_462.6 S05 M05B4	91	F304_462.6 P63 BN63B4	92
3.0	514	1.8	433.7	8500	F404_433.7 S05 M05B4	95	F404_433.7 P63 BN63B4	96
3.1	509	3.1	429.1	12000			F504_429.1 P63 BN63B4	100
3.2	482	1.1	831.6	6500	F304_831.6 S05 M05A2	91	F304_831.6 P63 BN63A2	92
3.7	431	1.3	374.4	6500			F303_374.4 P63 BN63B4	92
4.0	397	2.4	344.8	8500			F403_344.8 P63 BN63B4	96
4.7	341	2.8	296.6	8500			F403_296.6 P63 BN63B4	96
4.7	338	1.6	293.8	6500			F303_293.8 P63 BN63B4	92
5.5	292	1.9	253.6	6500			F303_253.6 P63 BN63B4	92
5.8	276	3.4	240.1	8500			F403_240.1 P63 BN63B4	96
6.3	248	1.0	209.3	4000	F203_209.3 S05 M05B4	87	F203_209.3 P63 BN63B4	88
6.8	240	1.0	132.2	4000	F202_132.2 S1 M1SC6	87	F202_132.2 P71 BN71A6	88
6.9	233	2.4	202.3	6500			F303_202.3 P63 BN63B4	92
7.6	205	1.2	172.6	4000	F203_172.6 S05 M05B4	87	F203_172.6 P63 BN63B4	88
7.9	207	1.2	114.3	4000	F202_114.3 S1 M1SC6	87	F202_114.3 P71 BN71A6	88
8.3	192	2.9	166.8	6500			F303_166.8 P63 BN63B4	92
10.0	164	1.5	90.4	4000	F202_90.4 S1 M1SC6	87	F202_90.4 P71 BN71A6	88
10.5	155	1.6	132.2	4000	F202_132.2 S05 M05B4	87	F202_132.2 P63 BN63B4	88
10.9	149	0.9	127.1	2800	F102_127.1 S05 M05B4	83	F102_127.1 P63 BN63B4	84
12.2	134	1.9	114.3	4000	F202_114.3 S05 M05B4	87	F202_114.3 P63 BN63B4	88

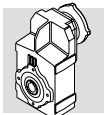


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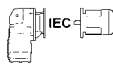
n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
13.1	125	1.1	106.0	2800	F102_106.0 S05 M05B4	83	F102_106.0 P63 BN63B4	84
14.3	114	1.2	63.0	2800	F102_63.0 S1 M1SC6	83	F102_63.0 P71 BN71A6	84
14.5	112	2.2	61.9	4000	F202_61.9 S1 M1SC6	87	F202_61.9 P71 BN71A6	88
15.2	107	1.3	91.5	2800	F102_91.5 S05 M05B4	83	F102_91.5 P63 BN63B4	84
15.4	106	2.4	90.4	4000	F202_90.4 S05 M05B4	87	F202_90.4 P63 BN63B4	88
18.1	90	2.8	76.8	4000	F202_76.8 S05 M05B4	87	F202_76.8 P63 BN63B4	88
19.5	84	1.7	71.1	2800	F102_71.1 S05 M05B4	83	F102_71.1 P63 BN63B4	84
22.1	74	1.9	63.0	2800	F102_63.0 S05 M05B4	83	F102_63.0 P63 BN63B4	84
22.5	73	3.4	61.9	4000	F202_61.9 S05 M05B4	87	F202_61.9 P63 BN63B4	88
28.5	57	2.4	48.7	2800	F102_48.7 S05 M05B4	83	F102_48.7 P63 BN63B4	84
35	47	3.0	39.6	2800	F102_39.6 S05 M05B4	83	F102_39.6 P63 BN63B4	84
42	39	3.6	33.0	2800	F102_33.0 S05 M05B4	83	F102_33.0 P63 BN63B4	84
54	30	4.6	25.8	2780	F102_25.8 S05 M05B4	83	F102_25.8 P63 BN63B4	84
72	23	6.0	19.3	2540	F102_19.3 S05 M05B4	83	F102_19.3 P63 BN63B4	84
95	17	6.9	14.6	2330	F102_14.6 S05 M05B4	83	F102_14.6 P63 BN63B4	84
107	15	6.8	13.0	2240	F102_13.0 S05 M05B4	83	F102_13.0 P63 BN63B4	84
142	11	7.8	9.8	2040	F102_9.8 S05 M05B4	83	F102_9.8 P63 BN63B4	84
188	9	8.7	7.4	1870	F102_7.4 S05 M05B4	83	F102_7.4 P63 BN63B4	84
216	8	1	13.0	1790	F102_13.0 S05 M05A2	83	F102_13.0 P63 BN63A2	84
288	6	1	9.8	1630	F102_9.8 S05 M05A2	83	F102_9.8 P63 BN63A2	84

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0.41	5282	0.9	2188	35000	F704_2188 S1 M1SD6	107	F704_2188 P71 BN71B6	108
0.45	4797	1.7	1987	45000	F804_1987 S1 M1SD6	111	F804_1987 P71 BN71B6	112
0.52	4145	1.2	1717	35000	F704_1717 S1 M1SD6	107	F704_1717 P71 BN71B6	108
0.53	4126	1.9	1709	45000	F804_1709 S1 M1SD6	111	F804_1709 P71 BN71B6	112
0.60	3601	1.4	2188	35000			F704_2188 P63 BN63C4	108
0.63	3457	1.4	2188	35000			F704_2188 P71 BN71A4	108
0.68	3190	1.6	2019	35000			F704_2019 P71 BN71A4	108
0.69	3140	2.5	1987	45000			F804_1987 P71 BN71A4	112
0.79	2754	1.1	1141	20000	F604_1141 S1 M1SD6	103	F604_1141 P71 BN71B6	104
0.80	2713	1.8	1717	35000			F704_1717 P71 BN71A4	108
0.80	2700	3.0	1709	45000			F804_1709 P71 BN71A4	112
0.96	2252	2.2	1368	35000			F704_1368 P63 BN63C4	108
1.0	2137	1.4	885.1	20000	F604_885.1 S1 M1SD6	103	F604_885.1 P71 BN71B6	104
1.2	1868	2.7	1182	35000			F704_1182 P71 BN71A4	108
1.3	1665	1.7	1054	20000			F604_1054 P71 BN71A4	104
1.4	1540	3.2	974.4	35000			F704_974.4 P71 BN71A4	108
1.4	1515	1.9	958.9	20000			F604_958.9 P71 BN71A4	104
1.7	1306	1.2	826.4	12000			F504_826.4 P71 BN71A4	100
1.7	1294	2.2	819.0	20000			F604_819.0 P71 BN71A4	104
2.0	1069	1.5	676.3	12000			F504_676.3 P71 BN71A4	100
2.1	1047	2.8	662.4	20000			F604_662.4 P71 BN71A4	104
2.4	905	1.0	549.8	8500	F404_549.8 S05 M05C4	95	F404_549.8 P71 BN71A4	96
2.6	838	1.9	530.5	12000			F504_530.5 P71 BN71A4	100
3.0	714	1.3	433.7	8500	F404_433.7 S05 M05C4	95	F404_433.7 P71 BN71A4	96
3.2	678	2.4	429.1	12000			F504_429.1 P71 BN71A4	100
3.7	605	0.9	374.4	6500			F303_374.4 P71 BN71A4	92
3.7	592	1.6	240.1	8500	F403_240.1 S1 M1SD6	95	F403_240.1 P71 BN71B6	96
4.0	557	1.7	344.8	8500			F403_344.8 P71 BN71A4	96
4.6	479	2.0	296.6	8500			F403_296.6 P71 BN71A4	96
4.7	474	1.2	293.8	6500			F303_293.8 P71 BN71A4	92
5.4	409	1.3	253.6	6500			F303_253.6 P71 BN71A4	92
5.7	388	2.4	240.1	8500			F403_240.1 P71 BN71A4	96
6.8	327	1.7	202.3	6500			F303_202.3 P71 BN71A4	92
6.9	321	3.0	198.9	8500			F403_198.9 P71 BN71A4	96
7.5	296	1.9	374.4	6500			F303_374.4 P63 BN63B2	92
8.2	269	2.0	166.8	6500			F303_166.8 P71 BN71A4	92
9.8	227	2.4	140.7	6500			F303_140.7 P71 BN71A4	92
10.0	228	1.1	90.4	4000	F202_90.4 S1 M1SD6	87	F202_90.4 P71 BN71B6	88
10.4	218	1.1	132.2	4000	F202_132.2 S05 M05C4	87	F202_132.2 P71 BN71A4	88
12.0	189	1.3	114.3	4000	F202_114.3 S05 M05C4	87	F202_114.3 P71 BN71A4	88
12.2	182	3.0	112.5	6500			F303_112.5 P71 BN71A4	92
14.5	156	1.6	61.9	4000	F202_61.9 S1 M1SD6	87	F202_61.9 P71 BN71B6	88
15.0	151	0.9	91.5	2800	F102_91.5 S05 M05C4	83	F102_91.5 P71 BN71A4	84

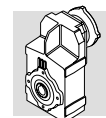


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n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
15.2	149	1.7	90.4	4000	F202_90.4 S05 M05C4	87	F202_90.4 P71 BN71A4	88
17.9	127	2.0	76.8	4000	F202_76.8 S05 M05C4	87	F202_76.8 P71 BN71A4	88
18.5	123	1.1	48.7	2800	F102_48.7 S1 M1SD6	83	F102_48.7 P71 BN71B6	84
19.3	117	1.2	71.1	2800	F102_71.1 S05 M05C4	83	F102_71.1 P71 BN71A4	84
21.8	104	1.3	63.0	2800	F102_63.0 S05 M05C4	83	F102_63.0 P71 BN71A4	84
22.2	102	2.4	61.9	4000	F202_61.9 S05 M05C4	87	F202_61.9 P71 BN71A4	88
27.1	84	3.0	50.7	4000	F202_50.7 S05 M05C4	87	F202_50.7 P71 BN71A4	88
28.2	80	1.7	48.7	2800	F102_48.7 S05 M05C4	83	F102_48.7 P71 BN71A4	84
35	65	2.1	39.6	2800	F102_39.6 S05 M05C4	83	F102_39.6 P71 BN71A4	84
42	54	2.6	33.0	2800	F102_33.0 S05 M05C4	83	F102_33.0 P71 BN71A4	84
47	49	2.9	19.3	2800	F102_19.3 S1 M1SD6	83	F102_19.3 P71 BN71B6	84
53	43	3.3	25.8	2750	F102_25.8 S05 M05C4	83	F102_25.8 P71 BN71A4	84
71	32	4.3	19.3	2520	F102_19.3 S05 M05C4	83	F102_19.3 P71 BN71A4	84
94	24	4.9	14.6	2310	F102_14.6 S05 M05C4	83	F102_14.6 P71 BN71A4	84
106	21	4.8	13.0	2230	F102_13.0 S05 M05C4	83	F102_13.0 P71 BN71A4	84
141	16	5.5	9.8	2030	F102_9.8 S05 M05C4	83	F102_9.8 P71 BN71A4	84
186	12	6.2	7.4	1860	F102_7.4 S05 M05C4	83	F102_7.4 P71 BN71A4	84
216	11	8.1	13.0	1780	F102_13.0 S05 M05B2	83	F102_13.0 P63 BN63B2	84
288	8	9.3	9.8	1620	F102_9.8 S05 M05B2	83	F102_9.8 P63 BN63B2	84
380	6	1 0.5	7.4	1480	F102_7.4 S05 M05B2	83	F102_7.4 P63 BN63B2	84

0.37 kW

0.43	7417	1.9	2099	55000			F904_2099 P80 BN80A6	116
0.53	6039	1.3	1709	45000	F804_1709 S1 M1LA6	111	F804_1709 P80 BN80A6	112
0.53	6014	2.3	1702	55000			F904_1702 P80 BN80A6	116
0.58	5576	1.4	1578	45000	F804_1578 S1 M1LA6	111	F804_1578 P80 BN80A6	112
0.71	4546	3.1	1937	55000			F904_1937 P71 BN71B4	116
0.75	4305	1.9	1834	45000	F804_1834 S1 M1SD4	111	F804_1834 P71 BN71B4	112
0.80	4030	1.2	1717	35000	F704_1717 S1 M1SD4	107	F704_1717 P71 BN71B4	108
0.80	4011	2.0	1709	45000	F804_1709 S1 M1SD4	111	F804_1709 P71 BN71B4	112
0.99	3248	2.5	1384	45000	F804_1384 S1 M1SD4	111	F804_1384 P71 BN71B4	112
1.0	3211	1.6	1368	35000	F704_1368 S1 M1SD4	107	F704_1368 P71 BN71B4	108
1.2	2690	3.0	1146	45000	F804_1146 S1 M1SD4	111	F804_1146 P71 BN71B4	112
1.2	2678	1.1	1141	20000	F604_1141 S1 M1SD4	103	F604_1141 P71 BN71B4	104
1.3	2561	2.0	1091	35000	F704_1091 S1 M1SD4	107	F704_1091 P71 BN71B4	108
1.3	2474	1.2	1054	20000	F604_1054 S1 M1SD4	103	F604_1054 P71 BN71B4	104
1.4	2251	1.3	958.9	20000	F604_958.9 S1 M1SD4	103	F604_958.9 P71 BN71B4	104
1.5	2111	2.4	899.4	35000	F704_899.4 S1 M1SD4	107	F704_899.4 P71 BN71B4	108
1.5	2077	1.4	885.1	20000	F604_885.1 S1 M1SD4	103	F604_885.1 P71 BN71B4	104
1.7	1930	2.6	822.2	35000	F704_822.2 S1 M1SD4	107	F704_822.2 P71 BN71B4	108
1.7	1922	1.5	819.0	20000	F604_819.0 S1 M1SD4	103	F604_819.0 P71 BN71B4	104
1.8	1781	2.8	759.0	35000	F704_759.0 S1 M1SD4	107	F704_759.0 P71 BN71B4	108
1.8	1774	1.6	756.0	20000	F604_756.0 S1 M1SD4	103	F604_756.0 P71 BN71B4	104
2.1	1555	1.9	662.4	20000	F604_662.4 S1 M1SD4	103	F604_662.4 P71 BN71B4	104
2.1	1543	3.2	657.4	35000	F704_657.4 S1 M1SD4	107	F704_657.4 P71 BN71B4	108
2.6	1246	2.3	530.7	20000	F604_530.7 S1 M1SD4	103	F604_530.7 P71 BN71B4	104
2.6	1245	1.3	530.5	12000	F504_530.5 S1 M1SD4	99	F504_530.5 P71 BN71B4	100
3.2	1018	0.9	433.7	8500	F404_433.7 S1 M1SD4	95	F404_433.7 P71 BN71B4	96
3.2	1015	2.9	432.6	20000	F604_432.6 S1 M1SD4	103	F604_432.6 P71 BN71B4	104
3.2	1007	1.6	429.1	12000	F504_429.1 S1 M1SD4	99	F504_429.1 P71 BN71B4	100
3.9	846	1.9	352.5	12000	F503_352.5 S1 M1SD4	99	F503_352.5 P71 BN71B4	100
4.0	827	1.1	344.8	8500	F403_344.8 S1 M1SD4	95	F403_344.8 P71 BN71B4	96
4.6	711	1.3	296.6	8500	F403_296.6 S1 M1SD4	95	F403_296.6 P71 BN71B4	96
4.8	686	2.3	285.9	12000	F503_285.9 S1 M1SD4	99	F503_285.9 P71 BN71B4	100
5.4	608	0.9	253.6	6500	F303_253.6 S1 M1SD4	91	F303_253.6 P71 BN71B4	92
5.7	576	1.6	240.1	8500	F403_240.1 S1 M1SD4	95	F403_240.1 P71 BN71B4	96
5.7	575	2.8	239.8	12000	F503_239.8 S1 M1SD4	99	F503_239.8 P71 BN71B4	100
6.8	485	3.3	202.4	12000	F503_202.4 S1 M1SD4	99	F503_202.4 P71 BN71B4	100
6.8	485	1.1	202.3	6500	F303_202.3 S1 M1SD4	91	F303_202.3 P71 BN71B4	92
6.9	477	2.0	198.9	8500	F403_198.9 S1 M1SD4	95	F403_198.9 P71 BN71B4	96
8.1	405	2.3	168.7	8500	F403_168.7 S1 M1SD4	95	F403_168.7 P71 BN71B4	96
8.2	400	1.4	166.8	6500	F303_166.8 S1 M1SD4	91	F303_166.8 P71 BN71B4	92
9.7	338	1.6	140.7	6500	F303_140.7 S1 M1SD4	91	F303_140.7 P71 BN71B4	92
10.2	322	2.9	134.4	8500	F403_134.4 S1 M1SD4	95	F403_134.4 P71 BN71B4	96
12.2	270	2.0	112.5	6500	F303_112.5 S1 M1SD4	91	F303_112.5 P71 BN71B4	92
15.2	222	1.1	90.4	4000	F202_90.4 S1 M1SD4	87	F202_90.4 P71 BN71B4	88

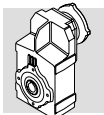


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n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
15.7	210	2.6	87.4	6500	F303_87.4 S1 M1SD4	91	F303_87.4 P71 BN71B4	92
17.8	188	1.3	76.8	4000	F202_76.8 S1 M1SD4	87	F202_76.8 P71 BN71B4	88
21.7	154	0.9	63.0	2800	F102_63.0 S1 M1SD4	83	F102_63.0 P71 BN71B4	84
22.1	152	1.6	61.9	4000	F202_61.9 S1 M1SD4	87	F202_61.9 P71 BN71B4	88
27.0	124	2.0	50.7	3900	F202_50.7 S1 M1SD4	87	F202_50.7 P71 BN71B4	88
28.1	119	1.2	48.7	2800	F102_48.7 S1 M1SD4	83	F102_48.7 P71 BN71B4	84
33	103	2.4	41.8	3700	F202_41.8 S1 M1SD4	87	F202_41.8 P71 BN71B4	88
35	97	1.4	39.6	2800	F102_39.6 S1 M1SD4	83	F102_39.6 P71 BN71B4	84
41	81	3.1	33.1	3460	F202_33.1 S1 M1SD4	87	F202_33.1 P71 BN71B4	88
42	81	1.7	33.0	2800	F102_33.0 S1 M1SD4	83	F102_33.0 P71 BN71B4	84
45	74	3.4	20.2	3380	F202_20.2 S1 M1LA6	87	F202_20.2 P80 BN80A6	88
47	71	2.0	19.3	2780	F102_19.3 S1 M1LA6	83	F102_19.3 P80 BN80A6	84
53	63	2.2	25.8	2690	F102_25.8 S1 M1SD4	83	F102_25.8 P71 BN71B4	84
62	54	2.6	14.6	2570	F102_14.6 S1 M1LA6	83	F102_14.6 P80 BN80A6	84
71	47	2.9	19.3	2470	F102_19.3 S1 M1SD4	83	F102_19.3 P71 BN71B4	84
94	36	3.3	14.6	2280	F102_14.6 S1 M1SD4	83	F102_14.6 P71 BN71B4	84
105	32	3.3	13.0	2200	F102_13.0 S1 M1SD4	83	F102_13.0 P71 BN71B4	84
140	24	3.7	9.8	2010	F102_9.8 S1 M1SD4	83	F102_9.8 P71 BN71B4	84
185	18	4.2	7.4	1850	F102_7.4 S1 M1SD4	83	F102_7.4 P71 BN71B4	84
216	16	5.5	13.0	1760	F102_13.0 S05 M05C2	83	F102_13.0 P71 BN71A2	84
288	12	6.3	9.8	1610	F102_9.8 S05 M05C2	83	F102_9.8 P71 BN71A2	84
380	9	7.1	7.4	1470	F102_7.4 S05 M05C2	83	F102_7.4 P71 BN71A2	84

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0.44	10905	1.3	2099	55000	F904_2099 S2 M2SA6	115	F904_2099 P80 BN80B6	116
0.46	10323	0.8	1987	45000	F804_1987 S2 M2SA6	111	F804_1987 P80 BN80B6	112
0.54	8879	0.9	1709	45000	F804_1709 S2 M2SA6	111	F804_1709 P80 BN80B6	112
0.54	8843	1.6	1702	55000	F904_1702 S2 M2SA6	115	F904_1702 P80 BN80B6	116
0.66	7218	1.9	2099	55000			F904_2099 P80 BN80A4	116
0.69	6882	1.2	1987	45000	F804_1987 S1 M1LA4	111	F804_1987 P80 BN80A4	112
0.75	6352	1.3	1834	45000	F804_1834 S1 M1LA4	111	F804_1834 P80 BN80A4	112
0.81	5919	1.4	1709	45000	F804_1709 S1 M1LA4	111	F804_1709 P80 BN80A4	112
0.82	5853	2.4	1702	55000			F904_1702 P80 BN80A4	116
0.97	4910	2.9	1428	55000			F904_1428 P80 BN80A4	116
1.0	4794	1.7	1384	45000	F804_1384 S1 M1LA4	111	F804_1384 P80 BN80A4	112
1.2	4094	1.2	1182	35000	F704_1182 S1 M1LA4	107	F704_1182 P80 BN80A4	108
1.2	3969	2.0	1146	45000	F804_1146 S1 M1LA4	111	F804_1146 P80 BN80A4	112
1.4	3375	1.5	974.4	35000	F704_974.4 S1 M1LA4	107	F704_974.4 P80 BN80A4	108
1.5	3115	1.6	899.4	35000	F704_899.4 S1 M1LA4	107	F704_899.4 P80 BN80A4	108
1.5	3108	2.6	897.3	45000	F804_897.3 S1 M1LA4	111	F804_897.3 P80 BN80A4	112
1.7	2848	1.8	822.2	35000	F704_822.2 S1 M1LA4	107	F704_822.2 P80 BN80A4	108
1.8	2629	1.9	759.0	35000	F704_759.0 S1 M1LA4	107	F704_759.0 P80 BN80A4	108
1.8	2618	1.1	756.0	20000	F604_756.0 S1 M1LA4	103	F604_756.0 P80 BN80A4	104
2.1	2294	1.3	662.4	20000	F604_662.4 S1 M1LA4	103	F604_662.4 P80 BN80A4	104
2.1	2277	2.2	657.4	35000	F704_657.4 S1 M1LA4	107	F704_657.4 P80 BN80A4	108
2.3	2118	1.4	611.4	20000	F604_611.4 S1 M1LA4	103	F604_611.4 P80 BN80A4	104
2.3	2102	2.4	606.8	35000	F704_606.8 S1 M1LA4	107	F704_606.8 P80 BN80A4	108
2.7	1768	2.8	510.4	35000	F704_510.4 S1 M1LA4	107	F704_510.4 P80 BN80A4	108
2.8	1696	1.7	489.8	20000	F604_489.8 S1 M1LA4	103	F604_489.8 P80 BN80A4	104
3.2	1498	1.9	432.6	20000	F604_432.6 S1 M1LA4	103	F604_432.6 P80 BN80A4	104
3.2	1486	1.1	429.1	12000	F504_429.1 S1 M1LA4	99	F504_429.1 P80 BN80A4	100
3.5	1383	2.1	399.3	20000	F604_399.3 S1 M1LA4	103	F604_399.3 P80 BN80A4	104
3.9	1248	1.3	352.5	12000	F503_352.5 S1 M1LA4	99	F503_352.5 P80 BN80A4	100
4.0	1184	2.5	341.7	20000	F604_341.7 S1 M1LA4	103	F604_341.7 P80 BN80A4	104
4.7	1050	0.9	296.6	8500	F403_296.6 S1 M1LA4	95	F403_296.6 P80 BN80A4	96
4.8	1012	1.6	285.9	12000	F503_285.9 S1 M1LA4	99	F503_285.9 P80 BN80A4	100
4.9	994	2.9	280.7	20000			F603_280.7 P80 BN80A4	104
5.7	850	1.1	240.1	8500	F403_240.1 S1 M1LA4	95	F403_240.1 P80 BN80A4	96
5.8	849	1.9	239.8	12000	F503_239.8 S1 M1LA4	99	F503_239.8 P80 BN80A4	100
5.9	835	3.5	235.8	20000			F603_235.8 P80 BN80A4	104
6.8	716	2.2	202.4	12000	F503_202.4 S1 M1LA4	99	F503_202.4 P80 BN80A4	100
6.9	704	1.3	198.9	8500	F403_198.9 S1 M1LA4	95	F403_198.9 P80 BN80A4	96
8.2	597	1.6	168.7	8500	F403_168.7 S1 M1LA4	95	F403_168.7 P80 BN80A4	96
8.3	590	0.9	166.8	6500	F303_166.8 S1 M1LA4	91	F303_166.8 P80 BN80A4	92
8.3	586	2.7	165.6	12000	F503_165.6 S1 M1LA4	99	F503_165.6 P80 BN80A4	100
9.8	498	1.1	140.7	6500	F303_140.7 S1 M1LA4	91	F303_140.7 P80 BN80A4	92

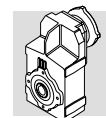


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n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
10.3	476	2.0	134.4	8500	F403_134.4 S1 M1LA4	95	F403_134.4 P80 BN80A4	96
10.6	460	3.5	129.9	12000	F503_129.9 S1 M1LA4	99	F503_129.9 P80 BN80A4	100
12.3	398	1.4	112.5	6500	F303_112.5 S1 M1LA4	91	F303_112.5 P80 BN80A4	92
13.0	375	2.5	106.0	8500	F403_106.0 S1 M1LA4	95	F403_106.0 P80 BN80A4	96
15.8	309	1.8	87.4	6500	F303_87.4 S1 M1LA4	91	F303_87.4 P80 BN80A4	92
16.3	300	3.2	84.9	8500	F403_84.9 S1 M1LA4	95	F403_84.9 P80 BN80A4	96
18.0	278	0.9	76.8	4000	F202_76.8 S1 M1LA4	87	F202_76.8 P80 BN80A4	88
20.0	244	2.2	69.1	6500	F303_69.1 S1 M1LA4	91	F303_69.1 P80 BN80A4	92
22.3	224	1.1	61.9	3890	F202_61.9 S1 M1LA4	87	F202_61.9 P80 BN80A4	88
26.5	184	2.8	52.1	6500			F303_52.1 P80 BN80A4	92
27.2	183	1.4	50.7	3720	F202_50.7 S1 M1LA4	87	F202_50.7 P80 BN80A4	88
33	151	1.7	41.8	3550	F202_41.8 S1 M1LA4	87	F202_41.8 P80 BN80A4	88
34	142	3.3	40.2	6500			F303_40.2 P80 BN80A4	92
35	143	1.0	39.6	2800	F102_39.6 S1 M1LA4	83	F102_39.6 P80 BN80A4	84
42	120	2.1	33.1	3340	F202_33.1 S1 M1LA4	87	F202_33.1 P80 BN80A4	88
42	119	1.2	33.0	2750	F102_33.0 S1 M1LA4	83	F102_33.0 P80 BN80A4	84
46	109	2.3	20.2	3260	F202_20.2 S2 M2SA6	87	F202_20.2 P80 BN80B6	88
48	105	1.3	19.3	2670	F102_19.3 S2 M2SA6	83	F102_19.3 P80 BN80B6	84
48	104	3.6	28.9	6500	F302_28.9 S1 M1LA4	91	F302_28.9 P80 BN80A4	92
53	94	2.6	25.9	3130	F202_25.9 S1 M1LA4	87	F202_25.9 P80 BN80A4	88
54	93	1.5	25.8	2590	F102_25.8 S1 M1LA4	83	F102_25.8 P80 BN80A4	84
62	80	2.9	14.8	2990	F202_14.8 S2 M2SA6	87	F202_14.8 P80 BN80B6	88
68	73	3.1	20.2	2910	F202_20.2 S1 M1LA4	87	F202_20.2 P80 BN80A4	88
71	70	1.9	19.3	2400	F102_19.3 S1 M1LA4	83	F102_19.3 P80 BN80A4	84
82	61	3.4	11.2	2760	F202_11.2 S2 M2SA6	87	F202_11.2 P80 BN80B6	88
94	53	2.2	14.6	2220	F102_14.6 S1 M1LA4	83	F102_14.6 P80 BN80A4	84
106	47	2.2	13.0	2140	F102_13.0 S1 M1LA4	83	F102_13.0 P80 BN80A4	84
141	35	2.5	9.8	1970	F102_9.8 S1 M1LA4	83	F102_9.8 P80 BN80A4	84
186	27	2.8	7.4	1810	F102_7.4 S1 M1LA4	83	F102_7.4 P80 BN80A4	84
216	23	3.7	13.0	1730	F102_13.0 S1 M1SD2	83	F102_13.0 P71 BN71B2	84
288	17	4.2	9.8	1590	F102_9.8 S1 M1SD2	83	F102_9.8 P71 BN71B2	84
380	13	4.8	7.4	1460	F102_7.4 S1 M1SD2	83	F102_7.4 P71 BN71B2	84

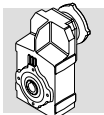
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0.44	14871	0.9	2099	55000	F904_2099 S2 M2SB6	115	F904_2099 P90 BN90S6	116
0.54	12058	1.2	1702	55000	F904_1702 S2 M2SB6	115	F904_1702 P90 BN90S6	116
0.59	11130	1.3	1571	55000	F904_1571 S2 M2SB6	115	F904_1571 P90 BN90S6	116
0.67	9772	1.4	2099	55000	F904_2099 S2 M2SA4	115	F904_2099 P80 BN80B4	116
0.72	9018	1.6	1937	55000	F904_1937 S2 M2SA4	115	F904_1937 P80 BN80B4	116
0.76	8538	0.9	1834	45000	F804_1834 S2 M2SA4	111	F804_1834 P80 BN80B4	112
0.82	7956	1.0	1709	45000	F804_1709 S2 M2SA4	111	F804_1709 P80 BN80B4	112
0.82	7924	1.8	1702	55000	F904_1702 S2 M2SA4	115	F904_1702 P80 BN80B4	116
0.89	7347	1.1	1578	45000	F804_1578 S2 M2SA4	111	F804_1578 P80 BN80B4	112
0.89	7314	1.9	1571	55000	F904_1571 S2 M2SA4	115	F904_1571 P80 BN80B4	116
0.98	6648	2.1	1428	55000	F904_1428 S2 M2SA4	115	F904_1428 P80 BN80B4	116
1.0	6443	1.2	1384	45000	F804_1384 S2 M2SA4	111	F804_1384 P80 BN80B4	112
1.1	6136	2.3	1318	55000	F904_1318 S2 M2SA4	115	F904_1318 P80 BN80B4	116
1.1	5945	1.3	1277	45000	F804_1277 S2 M2SA4	111	F804_1277 P80 BN80B4	112
1.2	5335	1.5	1146	45000	F804_1146 S2 M2SA4	111	F804_1146 P80 BN80B4	112
1.3	5177	2.7	1112	55000	F904_1112 S2 M2SA4	115	F904_1112 P80 BN80B4	116
1.3	4926	1.6	1058	45000	F804_1058 S2 M2SA4	111	F804_1058 P80 BN80B4	112
1.4	4590	3.0	986.0	55000	F904_986.0 S2 M2SA4	115	F904_986.0 P80 BN80B4	116
1.4	4536	1.1	974.4	35000	F704_974.4 S2 M2SA4	107	F704_974.4 P80 BN80B4	108
1.4	4525	1.8	972.0	45000	F804_972.0 S2 M2SA4	111	F804_972.0 P80 BN80B4	112
1.5	4238	3.3	910.2	55000	F904_910.2 S2 M2SA4	115	F904_910.2 P80 BN80B4	116
1.6	4187	1.2	899.4	35000	F704_899.4 S2 M2SA4	107	F704_899.4 P80 BN80B4	108
1.6	4177	1.9	897.3	45000	F804_897.3 S2 M2SA4	111	F804_897.3 P80 BN80B4	112
1.8	3605	2.2	774.4	45000	F804_774.4 S2 M2SA4	111	F804_774.4 P80 BN80B4	112
1.8	3534	1.4	759.0	35000	F704_759.0 S2 M2SA4	107	F704_759.0 P80 BN80B4	108
1.9	3520	0.8	756.0	20000	F604_756.0 S2 M2SA4	103	F604_756.0 P80 BN80B4	104
2.0	3328	2.4	714.9	45000	F804_714.9 S2 M2SA4	111	F804_714.9 P80 BN80B4	112
2.1	3084	0.9	662.4	20000	F604_662.4 S2 M2SA4	103	F604_662.4 P80 BN80B4	104
2.1	3061	1.6	657.4	35000	F704_657.4 S2 M2SA4	107	F704_657.4 P80 BN80B4	108
2.3	2846	1.0	611.4	20000	F604_611.4 S2 M2SA4	103	F604_611.4 P80 BN80B4	104
2.3	2844	2.8	610.9	45000	F804_610.9 S2 M2SA4	111	F804_610.9 P80 BN80B4	112
2.3	2825	1.8	606.8	35000	F704_606.8 S2 M2SA4	107	F704_606.8 P80 BN80B4	108



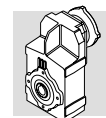
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n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
2.5	2625	3.0	563.9	45000	F804_563.9 S2 M2SA4	111	F804_563.9 P80 BN80B4	112
2.6	2471	1.2	530.7	20000	F604_530.7 S2 M2SA4	103	F604_530.7 P80 BN80B4	104
2.7	2376	2.1	510.4	35000	F704_510.4 S2 M2SA4	107	F704_510.4 P80 BN80B4	108
2.9	2280	1.3	489.8	20000	F604_489.8 S2 M2SA4	103	F604_489.8 P80 BN80B4	104
2.9	2277	3.5	489.1	45000	F804_489.1 S2 M2SA4	111	F804_489.1 P80 BN80B4	112
3.0	2194	2.3	471.2	35000	F704_471.2 S2 M2SA4	107	F704_471.2 P80 BN80B4	108
3.2	2014	1.4	432.6	20000	F604_432.6 S2 M2SA4	103	F604_432.6 P80 BN80B4	104
3.3	1998	0.8	429.1	12000	F504_429.1 S2 M2SA4	99	F504_429.1 P80 BN80B4	100
3.5	1879	2.7	403.5	35000	F704_403.5 S2 M2SA4	107	F704_403.5 P80 BN80B4	108
3.5	1859	1.6	399.3	20000	F604_399.3 S2 M2SA4	103	F604_399.3 P80 BN80B4	104
3.8	1734	2.9	372.5	35000	F704_372.5 S2 M2SA4	107	F704_372.5 P80 BN80B4	108
4.1	1591	1.8	341.7	20000	F604_341.7 S2 M2SA4	103	F604_341.7 P80 BN80B4	104
4.4	1468	2.0	315.4	20000	F604_315.4 S2 M2SA4	103	F604_315.4 P80 BN80B4	104
4.9	1360	1.2	285.9	12000	F503_285.9 S2 M2SA4	99	F503_285.9 P80 BN80B4	100
5.0	1335	2.2	280.7	20000	F603_280.7 S2 M2SA4	103	F603_280.7 P80 BN80B4	104
5.4	1233	2.4	259.1	20000	F603_259.1 S2 M2SA4	103	F603_259.1 P80 BN80B4	104
5.8	1141	1.4	239.8	12000	F503_239.8 S2 M2SA4	99	F503_239.8 P80 BN80B4	100
5.9	1122	2.6	235.8	20000	F603_235.8 S2 M2SA4	103	F603_235.8 P80 BN80B4	104
6.4	1036	2.8	217.6	20000	F603_217.6 S2 M2SA4	103	F603_217.6 P80 BN80B4	104
6.9	963	1.7	202.4	12000	F503_202.4 S2 M2SA4	99	F503_202.4 P80 BN80B4	100
7.0	958	3.0	201.4	20000	F603_201.4 S2 M2SA4	103	F603_201.4 P80 BN80B4	104
7.0	946	1.0	198.9	8500	F403_198.9 S2 M2SA4	95	F403_198.9 P80 BN80B4	96
8.3	803	1.2	168.7	8500	F403_168.7 S2 M2SA4	95	F403_168.7 P80 BN80B4	96
8.5	788	2.0	165.6	12000	F503_165.6 S2 M2SA4	99	F503_165.6 P80 BN80B4	100
10.4	639	1.5	134.4	8500	F403_134.4 S2 M2SA4	95	F403_134.4 P80 BN80B4	96
10.8	618	2.6	129.9	12000	F503_129.9 S2 M2SA4	99	F503_129.9 P80 BN80B4	100
12.4	535	1.0	112.5	6500	F303_112.5 S2 M2SA4	91	F303_112.5 P80 BN80B4	92
13.2	504	1.9	106.0	8500	F403_106.0 S2 M2SA4	95	F403_106.0 P80 BN80B4	96
13.3	500	3.2	105.1	12000	F503_105.1 S2 M2SA4	99	F503_105.1 P80 BN80B4	100
16.0	416	1.3	87.4	6500	F303_87.4 S2 M2SA4	91	F303_87.4 P80 BN80B4	92
16.5	404	2.4	84.9	8500	F403_84.9 S2 M2SA4	95	F403_84.9 P80 BN80B4	96
20.3	329	1.7	69.1	6500	F303_69.1 S2 M2SA4	91	F303_69.1 P80 BN80B4	92
21.1	316	3.0	66.5	8500	F403_66.5 S2 M2SA4	95	F403_66.5 P80 BN80B4	96
26.3	259	1.4	35.0	6500	F302_35.0 S2 M2SB6	91	F302_35.0 P90 BN90S6	92
26.9	248	2.1	52.1	6500	F303_52.1 S2 M2SA4	91	F303_52.1 P80 BN80B4	92
27.6	247	1.0	50.7	3510	F202_50.7 S2 M2SA4	87	F202_50.7 P80 BN80B4	88
33	203	1.2	41.8	3370	F202_41.8 S2 M2SA4	87	F202_41.8 P80 BN80B4	88
35	191	2.5	40.2	6500	F303_40.2 S2 M2SA4	91	F303_40.2 P80 BN80B4	92
35	192	1.3	25.9	3330	F202_25.9 S2 M2SB6	87	F202_25.9 P90 BN90S6	88
40	172	3.4	35.3	8500	F402_35.3 S2 M2SA4	95	F402_35.3 P80 BN80B4	96
40	170	2.1	35.0	6500	F302_35.0 S2 M2SA4	91	F302_35.0 P80 BN80B4	92
42	161	1.6	33.1	3200	F202_33.1 S2 M2SA4	87	F202_33.1 P80 BN80B4	88
46	149	1.7	20.2	3140	F202_20.2 S2 M2SB6	87	F202_20.2 P90 BN90S6	88
48	143	1.0	19.3	2550	F102_19.3 S2 M2SB6	83	F102_19.3 P90 BN90S6	84
49	140	2.7	28.9	6500	F302_28.9 S2 M2SA4	91	F302_28.9 P80 BN80B4	92
54	126	1.9	25.9	3020	F202_25.9 S2 M2SA4	87	F202_25.9 P80 BN80B4	88
54	125	1.1	25.8	2470	F102_25.8 S2 M2SA4	83	F102_25.8 P80 BN80B4	84
57	118	3.2	24.4	6500	F302_24.4 S2 M2SA4	91	F302_24.4 P80 BN80B4	92
62	109	2.1	14.8	2910	F202_14.8 S2 M2SB6	87	F202_14.8 P90 BN90S6	88
63	108	1.3	14.6	2390	F102_14.6 S2 M2SB6	83	F102_14.6 P90 BN90S6	84
69	98	2.3	20.2	2830	F202_20.2 S2 M2SA4	87	F202_20.2 P80 BN80B4	88
72	94	1.4	19.3	2310	F102_19.3 S2 M2SA4	83	F102_19.3 P80 BN80B4	84
82	83	2.5	11.2	2690	F202_11.2 S2 M2SB6	87	F202_11.2 P90 BN90S6	88
95	72	2.8	14.8	2600	F202_14.8 S2 M2SA4	87	F202_14.8 P80 BN80B4	88
96	71	1.7	14.6	2150	F102_14.6 S2 M2SA4	83	F102_14.6 P80 BN80B4	84
105	65	2.8	8.7	2510	F202_8.7 S2 M2SB6	87	F202_8.7 P90 BN90S6	88
107	63	1.6	13.0	2070	F102_13.0 S2 M2SA4	83	F102_13.0 P80 BN80B4	84
108	63	3.1	25.9	2500	F202_25.9 S1 M1LA2	87	F202_25.9 P80 BN80A2	88
109	63	2.0	25.8	2080	F102_25.8 S1 M1LA2	83	F102_25.8 P80 BN80A2	84
124	55	1.7	7.4	1990	F102_7.4 S2 M2SB6	83	F102_7.4 P90 BN90S6	84
125	55	3.2	11.2	2390	F202_11.2 S2 M2SA4	87	F202_11.2 P80 BN80B4	88
139	49	3.7	20.2	2330	F202_20.2 S1 M1LA2	87	F202_20.2 P80 BN80A2	88
143	47	1.9	9.8	1920	F102_9.8 S2 M2SA4	83	F102_9.8 P80 BN80B4	84
189	36	2.1	7.4	1770	F102_7.4 S2 M2SA4	83	F102_7.4 P80 BN80B4	84
191	36	2.6	14.6	1770	F102_14.6 S1 M1LA2	83	F102_14.6 P80 BN80A2	84
215	32	2.7	13.0	1710	F102_13.0 S1 M1LA2	83	F102_13.0 P80 BN80A2	84
287	24	3.1	9.8	1570	F102_9.8 S1 M1LA2	83	F102_9.8 P80 BN80A2	84
378	18	3.5	7.4	1440	F102_7.4 S1 M1LA2	83	F102_7.4 P80 BN80A2	84



1.1 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
0.54	17685	0.8	1702	55000	F904_1702 S3 M3SA6	115	F904_1702 P90 BN90L6	116
0.64	14838	0.9	1428	55000	F904_1428 S3 M3SA6	115	F904_1428 P90 BN90L6	116
0.67	14332	1.0	2099	55000	F904_2099 S2 M2SB4	115	F904_2099 P90 BN90S4	116
0.72	13226	1.1	1937	55000	F904_1937 S2 M2SB4	115	F904_1937 P90 BN90S4	116
0.82	11622	1.2	1702	55000	F904_1702 S2 M2SB4	115	F904_1702 P90 BN90S4	116
0.89	10727	1.3	1571	55000	F904_1571 S2 M2SB4	115	F904_1571 P90 BN90S4	116
0.98	9751	1.4	1428	55000	F904_1428 S2 M2SB4	115	F904_1428 P90 BN90S4	116
1.2	8228	1.7	1205	55000	F904_1205 S2 M2SB4	115	F904_1205 P90 BN90S4	116
1.3	7593	1.8	1112	55000	F904_1112 S2 M2SB4	115	F904_1112 P90 BN90S4	116
1.3	7224	1.1	1058	45000	F804_1058 S2 M2SB4	111	F804_1058 P90 BN90S4	112
1.4	6733	2.1	986.0	55000	F904_986.0 S2 M2SB4	115	F904_986.0 P90 BN90S4	116
1.4	6637	1.2	972.0	45000	F804_972.0 S2 M2SB4	111	F804_972.0 P90 BN90S4	112
1.5	6215	2.3	910.2	55000	F904_910.2 S2 M2SB4	115	F904_910.2 P90 BN90S4	116
1.6	6141	0.8	899.4	35000	F704_899.4 S2 M2SB4	107	F704_899.4 P90 BN90S4	108
1.8	5288	1.5	774.4	45000	F804_774.4 S2 M2SB4	111	F804_774.4 P90 BN90S4	112
1.8	5281	2.7	773.4	55000	F904_773.4 S2 M2SB4	115	F904_773.4 P90 BN90S4	116
1.8	5183	1.0	759.0	35000	F704_759.0 S2 M2SB4	107	F704_759.0 P90 BN90S4	108
2.0	4882	1.6	714.9	45000	F804_714.9 S2 M2SB4	111	F804_714.9 P90 BN90S4	112
2.0	4875	2.9	714.0	55000	F904_714.0 S2 M2SB4	115	F904_714.0 P90 BN90S4	116
2.1	4489	1.1	657.4	35000	F704_657.4 S2 M2SB4	107	F704_657.4 P90 BN90S4	108
2.2	4272	3.3	625.6	55000	F904_625.6 S2 M2SB4	115	F904_625.6 P90 BN90S4	116
2.3	4171	1.9	610.9	45000	F804_610.9 S2 M2SB4	111	F804_610.9 P90 BN90S4	112
2.3	4143	1.2	606.8	35000	F704_606.8 S2 M2SB4	107	F704_606.8 P90 BN90S4	108
2.5	3850	2.1	563.9	45000	F804_563.9 S2 M2SB4	111	F804_563.9 P90 BN90S4	112
2.7	3485	1.4	510.4	35000	F704_510.4 S2 M2SB4	107	F704_510.4 P80 BN80C4	108
3.0	3217	1.6	471.2	35000	F704_471.2 S2 M2SB4	107	F704_471.2 P90 BN90S4	108
3.1	3083	2.6	451.5	45000	F804_451.5 S2 M2SB4	111	F804_451.5 P90 BN90S4	112
3.2	2954	1.0	432.6	20000	F604_432.6 S2 M2SB4	103	F604_432.6 P90 BN90S4	104
3.5	2755	1.8	403.5	35000	F704_403.5 S2 M2SB4	107	F704_403.5 P90 BN90S4	108
3.5	2727	1.1	399.3	20000	F604_399.3 S2 M2SB4	103	F604_399.3 P90 BN90S4	104
3.8	2544	2.0	372.5	35000	F704_372.5 S2 M2SB4	107	F704_372.5 P90 BN90S4	108
4.1	2333	1.2	341.7	20000	F604_341.7 S2 M2SB4	103	F604_341.7 P90 BN90S4	104
4.4	2154	1.3	315.4	20000	F604_315.4 S2 M2SB4	103	F604_315.4 P90 BN90S4	104
4.6	2078	2.4	304.3	35000	F704_304.3 S2 M2SB4	107	F704_304.3 P90 BN90S4	108
5.0	1918	2.6	280.9	35000	F704_280.9 S2 M2SB4	107	F704_280.9 P90 BN90S4	108
5.0	1959	1.5	280.7	20000	F603_280.7 S2 M2SB4	103	F603_280.7 P90 BN90S4	104
5.4	1808	1.6	259.1	20000	F603_259.1 S2 M2SB4	103	F603_259.1 P90 BN90S4	104
5.8	1674	1.0	239.8	12000	F503_239.8 S2 M2SB4	99	F503_239.8 P90 BN90S4	100
5.9	1645	1.8	235.8	20000	F603_235.8 S2 M2SB4	103	F603_235.8 P90 BN90S4	104
6.0	1602	3.1	234.6	35000	F704_234.6 S2 M2SB4	107	F704_234.6 P90 BN90S4	108
6.4	1519	1.9	217.6	20000	F603_217.6 S2 M2SB4	103	F603_217.6 P90 BN90S4	104
6.5	1478	3.4	216.5	35000	F704_216.5 S2 M2SB4	107	F704_216.5 P90 BN90S4	108
6.9	1412	1.1	202.4	12000	F503_202.4 S2 M2SB4	99	F503_202.4 P90 BN90S4	100
7.5	1297	2.2	185.9	20000	F603_185.9 S2 M2SB4	103	F603_185.9 P90 BN90S4	104
8.5	1156	1.4	165.6	12000	F503_165.6 S2 M2SB4	99	F503_165.6 P90 BN90S4	100
8.6	1137	2.6	162.9	20000	F603_162.9 S2 M2SB4	103	F603_162.9 P90 BN90S4	104
10.4	938	1.0	134.4	8500	F403_134.4 S2 M2SB4	95	F403_134.4 P90 BN90S4	96
10.7	911	3.2	130.5	20000	F603_130.5 S2 M2SB4	103	F603_130.5 P90 BN90S4	104
10.8	907	1.8	129.9	12000	F503_129.9 S2 M2SB4	99	F503_129.9 P90 BN90S4	100
13.2	740	1.3	106.0	8500	F403_106.0 S2 M2SB4	95	F403_106.0 P90 BN90S4	96
13.3	733	2.2	105.1	12000	F503_105.1 S2 M2SB4	99	F503_105.1 P90 BN90S4	100
16.0	610	0.9	87.4	6500	F303_87.4 S2 M2SB4	91	F303_87.4 P90 BN90S4	92
16.5	592	1.6	84.9	8500	F403_84.9 S2 M2SB4	95	F403_84.9 P90 BN90S4	96
16.8	581	2.8	83.2	12000	F503_83.2 S2 M2SB4	99	F503_83.2 P90 BN90S4	100
17.7	553	1.0	52.1	6500	F303_52.1 S3 M3SA6	91	F303_52.1 P90 BN90L6	92
20.3	482	1.1	69.1	6500	F303_69.1 S2 M2SB4	91	F303_69.1 P90 BN90S4	92
21.1	464	2.0	66.5	8500	F403_66.5 S2 M2SB4	95	F403_66.5 P90 BN90S4	96
21.3	459	3.5	65.8	12000	F503_65.8 S2 M2SB4	99	F503_65.8 P90 BN90S4	100
26.3	380	0.9	35.0	6500	F302_35.0 S3 M3SA6	91	F302_35.0 P90 BN90L6	92
26.9	364	1.4	52.1	6500	F303_52.1 S2 M2SB4	91	F303_52.1 P90 BN90S4	92
27.2	359	2.4	51.5	8500	F403_51.5 S2 M2SB4	95	F403_51.5 P90 BN90S4	96
32	313	1.2	28.9	6500	F302_28.9 S3 M3SA6	91	F302_28.9 P90 BN90L6	92
35	280	1.7	40.2	6500	F303_40.2 S2 M2SB4	91	F303_40.2 P90 BN90S4	92
37	265	2.8	37.9	8500	F403_37.9 S2 M2SB4	95	F403_37.9 P90 BN90S4	96
40	250	1.4	35.0	6500	F302_35.0 S2 M2SB4	91	F302_35.0 P90 BN90S4	92
42	236	1.1	33.1	2980	F202_33.1 S2 M2SB4	87	F202_33.1 P90 BN90S4	88
46	219	1.1	20.2	2940	F202_20.2 S3 M3SA6	87	F202_20.2 P90 BN90L6	88
47	213	3.0	29.9	8500	F402_29.9 S2 M2SB4	95	F402_29.9 P90 BN90S4	96
49	206	1.8	28.9	6500	F302_28.9 S2 M2SB4	91	F302_28.9 P90 BN90S4	92
54	185	1.3	25.9	2840	F202_25.9 S2 M2SB4	87	F202_25.9 P90 BN90S4	88

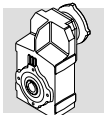


1.1 kW

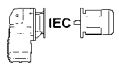
n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
57	174	2.2	24.4	6500	F302_24.4 S2 M2SB4	91	F302_24.4 P90 BN90S4	92
62	161	1.4	14.8	2760	F202_14.8 S3 M3SA6	87	F202_14.8 P90 BN90L6	88
69	144	1.6	20.2	2690	F202_20.2 S2 M2SB4	87	F202_20.2 P90 BN90S4	88
71	141	1.0	39.6	2180	F102_39.6 S2 M2SA2	83	F102_39.6 P80 BN80B2	84
72	139	2.7	19.5	6370	F302_19.5 S2 M2SB4	91	F302_19.5 P90 BN90S4	92
72	138	1.0	19.3	2170	F102_19.3 S2 M2SB4	83	F102_19.3 P90 BN90S4	84
82	122	1.7	11.2	2570	F202_11.2 S3 M3SA6	87	F202_11.2 P90 BN90L6	88
93	108	3.5	15.1	5930	F302_15.1 S2 M2SB4	91	F302_15.1 P90 BN90S4	92
95	105	1.9	14.8	2500	F202_14.8 S2 M2SB4	87	F202_14.8 P90 BN90S4	88
96	104	1.1	14.6	2050	F102_14.6 S2 M2SB4	83	F102_14.6 P90 BN90S4	84
107	93	1.1	13.0	1980	F102_13.0 S2 M2SB4	83	F102_13.0 P90 BN90S4	84
108	92	2.1	25.9	2420	F202_25.9 S2 M2SA2	87	F202_25.9 P80 BN80B2	88
124	80	1.1	7.4	1910	F102_7.4 S3 M3SA6	83	F102_7.4 P90 BN90L6	84
125	80	2.2	11.2	2310	F202_11.2 S2 M2SB4	87	F202_11.2 P90 BN90S4	88
139	72	2.5	20.2	2260	F202_20.2 S2 M2SA2	87	F202_20.2 P80 BN80B2	88
143	70	1.3	9.8	1840	F102_9.8 S2 M2SB4	83	F102_9.8 P90 BN90S4	84
160	62	2.5	8.7	2160	F202_8.7 S2 M2SB4	87	F202_8.7 P90 BN90S4	88
189	53	1.4	7.4	1720	F102_7.4 S2 M2SB4	83	F102_7.4 P90 BN90S4	84
189	53	3.1	14.8	2070	F202_14.8 S2 M2SA2	87	F202_14.8 P80 BN80B2	88
215	46	1.8	13.0	1660	F102_13.0 S2 M2SA2	83	F102_13.0 P80 BN80B2	84
218	46	2.8	6.4	1980	F202_6.4 S2 M2SB4	87	F202_6.4 P90 BN90S4	88
249	40	3.5	11.2	1910	F202_11.2 S2 M2SA2	87	F202_11.2 P80 BN80B2	88
287	35	2.1	9.8	1530	F102_9.8 S2 M2SA2	83	F102_9.8 P80 BN80B2	84
378	26	2.4	7.4	1410	F102_7.4 S2 M2SA2	83	F102_7.4 P80 BN80B2	84

1.5 kW

0.73	17908	0.8	1937	55000	F904_1937 S3 M3SA4	115	F904_1937 P90 BN90LA4	116
0.83	15735	0.9	1702	55000	F904_1702 S3 M3SA4	115	F904_1702 P90 BN90LA4	116
0.90	14524	1.0	1571	55000	F904_1571 S3 M3SA4	115	F904_1571 P90 BN90LA4	116
1.1	12185	1.1	1318	55000	F904_1318 S3 M3SA4	115	F904_1318 P90 BN90LA4	116
1.2	11140	1.3	1205	55000	F904_1205 S3 M3SA4	115	F904_1205 P90 BN90LA4	116
1.3	10281	1.4	1112	55000	F904_1112 S3 M3SA4	115	F904_1112 P90 BN90LA4	116
1.4	9116	1.5	986.0	55000	F904_986.0 S3 M3SA4	115	F904_986.0 P90 BN90LA4	116
1.5	8986	0.9	972.0	45000	F804_972.0 S3 M3SA4	111	F804_972.0 P90 BN90LA4	112
1.5	8415	1.7	910.2	55000	F904_910.2 S3 M3SA4	115	F904_910.2 P90 BN90LA4	116
1.6	8296	1.0	897.3	45000	F804_897.3 S3 M3SA4	111	F804_897.3 P90 BN90LA4	112
1.8	7159	1.1	774.4	45000	F804_774.4 S3 M3SA4	111	F804_774.4 P90 BN90LA4	112
1.8	7150	2.0	773.4	55000	F904_773.4 S3 M3SA4	115	F904_773.4 P90 BN90LA4	116
2.0	6609	1.2	714.9	45000	F804_714.9 S3 M3SA4	111	F804_714.9 P90 BN90LA4	112
2.0	6601	2.1	714.0	55000	F904_714.0 S3 M3SA4	115	F904_714.0 P90 BN90LA4	116
2.3	5784	2.4	625.6	55000	F904_625.6 S3 M3SA4	115	F904_625.6 P90 BN90LA4	116
2.3	5648	1.4	610.9	45000	F804_610.9 S3 M3SA4	111	F804_610.9 P90 BN90LA4	112
2.5	5213	1.5	563.9	45000	F804_563.9 S3 M3SA4	111	F804_563.9 P90 BN90LA4	112
2.8	4719	1.1	510.4	35000	F704_510.4 S3 M3SA4	107	F704_510.4 P90 BN90LA4	108
2.8	4582	3.1	495.6	55000	F904_495.6 S3 M3SA4	115	F904_495.6 P90 BN90LA4	116
2.9	4522	1.8	489.1	45000	F804_489.1 S3 M3SA4	111	F804_489.1 P90 BN90LA4	112
3.0	4356	1.1	471.2	35000	F704_471.2 S3 M3SA4	107	F704_471.2 P90 BN90LA4	108
3.1	4230	3.3	457.5	55000	F904_457.5 S3 M3SA4	115	F904_457.5 P90 BN90LA4	116
3.1	4174	1.9	451.5	45000	F804_451.5 S3 M3SA4	111	F804_451.5 P90 BN90LA4	112
3.5	3730	1.3	403.5	35000	F704_403.5 S3 M3SA4	107	F704_403.5 P90 BN90LA4	108
3.7	3543	2.3	383.2	45000	F804_383.2 S3 M3SA4	111	F804_383.2 P90 BN90LA4	112
3.8	3444	1.5	372.5	35000	F704_372.5 S3 M3SA4	107	F704_372.5 P90 BN90LA4	108
4.0	3270	2.4	353.7	45000	F804_353.7 S3 M3SA4	111	F804_353.7 P90 BN90LA4	112
4.1	3159	0.9	341.7	20000	F604_341.7 S3 M3SA4	103	F604_341.7 P90 BN90LA4	104
4.5	2916	1.0	315.4	20000	F604_315.4 S3 M3SA4	103	F604_315.4 P90 BN90LA4	104
4.6	2813	1.8	304.3	35000	F704_304.3 S3 M3SA4	107	F704_304.3 P90 BN90LA4	108
4.8	2743	2.9	296.7	45000	F804_296.7 S3 M3SA4	111	F804_296.7 P90 BN90LA4	112
5.0	2597	1.9	280.9	35000	F704_280.9 S3 M3SA4	107	F704_280.9 P90 BN90LA4	108
5.0	2652	1.1	280.7	20000	F603_280.7 S3 M3SA4	103	F603_280.7 P90 BN90LA4	104
5.1	2532	3.2	273.9	45000	F804_273.9 S3 M3SA4	111	F804_273.9 P90 BN90LA4	112
5.4	2448	1.2	259.1	20000	F603_259.1 S3 M3SA4	103	F603_259.1 P90 BN90LA4	104
6.0	2228	1.3	235.8	20000	F603_235.8 S3 M3SA4	103	F603_235.8 P90 BN90LA4	104
6.0	2169	2.3	234.6	35000	F704_234.6 S3 M3SA4	107	F704_234.6 P90 BN90LA4	108
6.5	2056	1.4	217.6	20000	F603_217.6 S3 M3SA4	103	F603_217.6 P90 BN90LA4	104
6.5	2002	2.5	216.5	35000	F704_216.5 S3 M3SA4	107	F704_216.5 P90 BN90LA4	108
7.0	1903	1.5	201.4	20000	F603_201.4 S3 M3SA4	103	F603_201.4 P90 BN90LA4	104

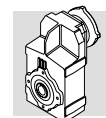


1.5 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
7.2	1852	2.7	196.0	35000	F703_196.0 S3 M3SA4	103	F703_196.0 P90 BN90LA4	108
7.6	1756	1.7	185.9	20000	F603_185.9 S3 M3SA4	103	F603_185.9 P90 BN90LA4	104
7.8	1710	2.9	180.9	35000	F703_180.9 S3 M3SA4	103	F703_180.9 P90 BN90LA4	108
8.5	1575	3.2	166.7	35000	F703_166.7 S3 M3SA4	103	F703_166.7 P90 BN90LA4	108
8.5	1565	1.0	165.6	12000	F503_165.6 S3 M3SA4	99	F503_165.6 P90 BN90LA4	100
8.7	1539	1.9	162.9	20000	F603_162.9 S3 M3SA4	103	F603_162.9 P90 BN90LA4	104
10.8	1233	2.4	130.5	20000	F603_130.5 S3 M3SA4	103	F603_130.5 P90 BN90LA4	104
10.9	1227	1.3	129.9	12000	F503_129.9 S3 M3SA4	99	F503_129.9 P90 BN90LA4	100
13.3	1005	2.9	106.4	20000	F603_106.4 S3 M3SA4	103	F603_106.4 P90 BN90LA4	104
13.3	1002	0.9	106.0	8500	F403_106.0 S3 M3SA4	95	F403_106.0 P90 BN90LA4	96
13.4	993	1.6	105.1	12000	F503_105.1 S3 M3SA4	99	F503_105.1 P90 BN90LA4	100
16.6	802	1.2	84.9	8500	F403_84.9 S3 M3SA4	95	F403_84.9 P90 BN90LA4	96
16.9	786	2.0	83.2	12000	F503_83.2 S3 M3SA4	99	F503_83.2 P90 BN90LA4	100
21.2	628	1.5	66.5	8500	F403_66.5 S3 M3SA4	95	F403_66.5 P90 BN90LA4	96
21.4	622	2.6	65.8	12000	F503_65.8 S3 M3SA4	99	F503_65.8 P90 BN90LA4	100
27.1	492	1.0	52.1	6500	F303_52.1 S3 M3SA4	91	F303_52.1 P90 BN90LA4	92
27.4	487	1.8	51.5	8500	F403_51.5 S3 M3SA4	95	F403_51.5 P90 BN90LA4	96
28.8	462	2.9	48.9	12000	F503_48.9 S3 M3SA4	99	F503_48.9 P90 BN90LA4	100
35	379	1.2	40.2	6500	F303_40.2 S3 M3SA4	91	F303_40.2 P90 BN90LA4	92
36	367	3.3	38.9	12000	F503_38.9 S3 M3SA4	99	F503_38.9 P90 BN90LA4	100
37	358	2.1	37.9	8500	F403_37.9 S3 M3SA4	95	F403_37.9 P90 BN90LA4	96
40	341	1.7	35.3	8500	F402_35.3 S3 M3SA4	95	F402_35.3 P90 BN90LA4	96
40	338	1.1	35.0	6500	F302_35.0 S3 M3SA4	91	F302_35.0 P90 BN90LA4	92
46	296	3.0	30.7	11900	F502_30.7 S3 M3SA4	99	F502_30.7 P90 BN90LA4	100
47	289	2.2	29.9	8500	F402_29.9 S3 M3SA4	95	F402_29.9 P90 BN90LA4	96
49	279	1.4	28.9	6500	F302_28.9 S3 M3SA4	91	F302_28.9 P90 BN90LA4	92
54	250	1.0	25.9	2640	F202_25.9 S3 M3SA4	87	F202_25.9 P90 BN90LA4	88
58	235	1.6	24.4	6500	F302_24.4 S3 M3SA4	91	F302_24.4 P90 BN90LA4	92
59	230	3.0	23.8	8500	F402_23.8 S3 M3SA4	95	F402_23.8 P90 BN90LA4	96
64	214	1.1	14.8	2580	F202_14.8 S3 M3LA6	87	F202_14.8 P100 BN100LA6	88
70	195	1.1	20.2	2530	F202_20.2 S3 M3SA4	87	F202_20.2 P90 BN90LA4	88
72	188	2.0	19.5	6160	F302_19.5 S3 M3SA4	91	F302_19.5 P90 BN90LA4	92
84	163	1.3	11.2	2420	F202_11.2 S3 M3LA6	87	F202_11.2 P100 BN100LA6	88
93	146	2.6	15.1	5770	F302_15.1 S3 M3SA4	91	F302_15.1 P90 BN90LA4	92
95	143	1.4	14.8	2380	F202_14.8 S3 M3SA4	87	F202_14.8 P90 BN90LA4	88
108	126	1.6	25.9	2320	F202_25.9 S2 M2SB2	87	F202_25.9 P90 BN90SA2	88
118	115	3.3	12.0	5410	F302_12.0 S3 M3SA4	91	F302_12.0 P90 BN90LA4	92
126	108	1.6	11.2	2220	F202_11.2 S3 M3SA4	87	F202_11.2 P90 BN90LA4	88
139	98	1.9	20.2	2180	F202_20.2 S2 M2SB2	87	F202_20.2 P90 BN90SA2	88
144	94	0.9	9.8	1760	F102_9.8 S3 M3SA4	83	F102_9.8 P90 BN90LA4	84
161	84	1.8	8.7	2090	F202_8.7 S3 M3SA4	87	F202_8.7 P90 BN90LA4	88
189	72	2.3	14.8	2020	F202_14.8 S2 M2SB2	87	F202_14.8 P90 BN90SA2	88
190	71	1.1	7.4	1650	F102_7.4 S3 M3SA4	83	F102_7.4 P90 BN90LA4	84
215	63	1.3	13.0	1600	F102_13.0 S2 M2SB2	83	F102_13.0 P90 BN90SA2	84
220	62	2.1	6.4	1930	F202_6.4 S3 M3SA4	87	F202_6.4 P90 BN90LA4	88
249	55	2.6	11.2	1860	F202_11.2 S2 M2SB2	87	F202_11.2 P90 BN90SA2	88
287	47	1.5	9.8	1490	F102_9.8 S2 M2SB2	83	F102_9.8 P90 BN90SA2	84
321	42	2.9	8.7	1740	F202_8.7 S2 M2SB2	87	F202_8.7 P90 BN90SA2	88
378	36	1.8	7.4	1380	F102_7.4 S2 M2SB2	83	F102_7.4 P90 BN90SA2	84
437	31	3.3	6.4	1590	F202_6.4 S2 M2SB2	87	F202_6.4 P90 BN90SA2	88

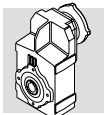
2.2 kW

1.2	16339	0.9	1205	55000	F904_1205 S3 M3LA4	115	F904_1205 P100 BN100LA4	116
1.3	15078	0.9	1112	55000	F904_1112 S3 M3LA4	115	F904_1112 P100 BN100LA4	116
1.4	13370	1.0	986.0	55000	F904_986.0 S3 M3LA4	115	F904_986.0 P100 BN100LA4	116
1.5	12342	1.1	910.2	55000	F904_910.2 S3 M3LA4	115	F904_910.2 P100 BN100LA4	116
1.8	10487	1.3	773.4	55000	F904_773.4 S3 M3LA4	115	F904_773.4 P100 BN100LA4	116
2.0	9682	1.4	714.0	55000	F904_714.0 S3 M3LA4	115	F904_714.0 P100 BN100LA4	116
2.3	8483	1.7	625.6	55000	F904_625.6 S3 M3LA4	115	F904_625.6 P100 BN100LA4	116
2.3	8284	1.0	610.9	45000	F804_610.9 S3 M3LA4	111	F804_610.9 P100 BN100LA4	112
2.8	6720	2.1	495.6	55000	F904_495.6 S3 M3LA4	115	F904_495.6 P100 BN100LA4	116
2.9	6632	1.2	489.1	45000	F804_489.1 S3 M3LA4	111	F804_489.1 P100 BN100LA4	112
3.1	6122	1.3	451.5	45000	F804_451.5 S3 M3LA4	111	F804_451.5 P100 BN100LA4	112
3.5	5471	0.9	403.5	35000	F704_403.5 S3 M3LA4	107	F704_403.5 P100 BN100LA4	108
3.6	5315	2.6	392.0	55000	F904_392.0 S3 M3LA4	115	F904_392.0 P100 BN100LA4	116
3.7	5196	1.5	383.2	45000	F804_383.2 S3 M3LA4	111	F804_383.2 P100 BN100LA4	112
3.8	5051	1.0	372.5	35000	F704_372.5 S3 M3LA4	107	F704_372.5 P100 BN100LA4	108



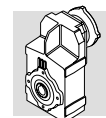
2.2 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
3.9	4906	2.9	361.8	55000	F904_361.8 S3 M3LA4	115	F904_361.8 P100 BN100LA4	116
4.0	4796	1.7	353.7	45000	F804_353.7 S3 M3LA4	111	F804_353.7 P100 BN100LA4	112
4.6	4126	1.2	304.3	35000	F704_304.3 S3 M3LA4	107	F704_304.3 P100 BN100LA4	108
4.8	4023	2.0	296.7	45000	F804_296.7 S3 M3LA4	111	F804_296.7 P100 BN100LA4	112
4.8	3947	3.5	291.1	55000	F904_291.1 S3 M3LA4	115	F904_291.1 P100 BN100LA4	116
5.0	3809	1.3	280.9	35000	F704_280.9 S3 M3LA4	107	F704_280.9 P100 BN100LA4	108
5.1	3714	2.2	273.9	45000	F804_273.9 S3 M3LA4	111	F804_273.9 P100 BN100LA4	112
6.0	3181	1.6	234.6	35000	F704_234.6 S3 M3LA4	107	F704_234.6 P100 BN100LA4	108
6.5	2963	2.7	218.5	45000	F804_218.5 S3 M3LA4	111	F804_218.5 P100 BN100LA4	112
6.5	3016	1.0	217.6	20000	F603_217.6 S3 M3LA4	103	F603_217.6 P100 BN100LA4	104
6.5	2936	1.7	216.5	35000	F704_216.5 S3 M3LA4	107	F704_216.5 P100 BN100LA4	108
7.1	2772	2.9	200.0	45000			F803_200.0 P100 BN100LA4	112
7.2	2716	1.8	196.0	35000	F703_196.0 S3 M3LA4	103	F703_196.0 P100 BN100LA4	108
7.6	2576	1.1	185.9	20000	F603_185.9 S3 M3LA4	103	F603_185.9 P100 BN100LA4	104
7.6	2558	3.1	184.6	45000			F803_184.6 P100 BN100LA4	112
7.8	2507	2.0	180.9	35000	F703_180.9 S3 M3LA4	103	F703_180.9 P100 BN100LA4	108
8.5	2310	2.2	166.7	35000	F703_166.7 S3 M3LA4	103	F703_166.7 P100 BN100LA4	108
8.7	2257	1.3	162.9	20000	F603_162.9 S3 M3LA4	103	F603_162.9 P100 BN100LA4	104
9.2	2132	2.3	153.8	35000	F703_153.8 S3 M3LA4	103	F703_153.8 P100 BN100LA4	108
9.4	2084	1.4	150.4	20000	F603_150.4 S3 M3LA4	103	F603_150.4 P100 BN100LA4	104
10.6	1842	2.7	133.0	35000	F703_133.0 S3 M3LA4	103	F703_133.0 P100 BN100LA4	108
10.8	1808	1.6	130.5	20000	F603_130.5 S3 M3LA4	103	F603_130.5 P100 BN100LA4	104
11.5	1701	2.9	122.7	35000	F703_122.7 S3 M3LA4	103	F703_122.7 P100 BN100LA4	108
11.7	1669	1.7	120.5	20000	F603_120.5 S3 M3LA4	103	F603_120.5 P100 BN100LA4	104
12.9	1519	3.3	109.6	35000	F703_109.6 S3 M3LA4	103	F703_109.6 P100 BN100LA4	108
13.3	1474	2.0	106.4	20000	F603_106.4 S3 M3LA4	103	F603_106.4 P100 BN100LA4	104
13.4	1456	1.1	105.1	12000	F503_105.1 S3 M3LA4	99	F503_105.1 P100 BN100LA4	100
14.4	1361	2.1	98.2	20000	F603_98.2 S3 M3LA4	103	F603_98.2 P100 BN100LA4	104
16.8	1164	2.5	84.0	20000	F603_84.0 S3 M3LA4	103	F603_84.0 P100 BN100LA4	104
16.9	1154	1.4	83.2	12000	F503_83.2 S3 M3LA4	99	F503_83.2 P100 BN100LA4	100
18.2	1075	2.7	77.6	20000	F603_77.6 S3 M3LA4	103	F603_77.6 P100 BN100LA4	104
20.7	946	3.1	68.3	20000	F603_68.3 S3 M3LA4	103	F603_68.3 P100 BN100LA4	104
21.2	921	1.0	66.5	8500	F403_66.5 S3 M3LA4	95	F403_66.5 P100 BN100LA4	96
21.4	912	1.6	65.8	12000	F503_65.8 S3 M3LA4	99	F503_65.8 P100 BN100LA4	100
22.4	873	3.3	63.0	20000	F603_63.0 S3 M3LA4	103	F603_63.0 P100 BN100LA4	104
27.4	714	1.2	51.5	8500	F403_51.5 S3 M3LA4	95	F403_51.5 P100 BN100LA4	96
28.8	678	2.0	48.9	12000	F503_48.9 S3 M3LA4	99	F503_48.9 P100 BN100LA4	100
36	539	2.3	38.9	12000	F503_38.9 S3 M3LA4	99	F503_38.9 P100 BN100LA4	100
40	500	1.2	35.3	8500	F402_35.3 S3 M3LA4	95	F402_35.3 P100 BN100LA4	96
46	434	2.1	30.7	11500	F502_30.7 S3 M3LA4	99	F502_30.7 P100 BN100LA4	100
47	424	1.5	29.9	8500	F402_29.9 S3 M3LA4	95	F402_29.9 P100 BN100LA4	96
49	409	0.9	28.9	6230	F302_28.9 S3 M3LA4	91	F302_28.9 P100 BN100LA4	92
58	345	1.1	24.4	6060	F302_24.4 S3 M3LA4	91	F302_24.4 P100 BN100LA4	92
59	340	2.9	24.0	10800	F502_24.0 S3 M3LA4	99	F502_24.0 P100 BN100LA4	100
59	338	2.1	23.8	8390	F402_23.8 S3 M3LA4	95	F402_23.8 P100 BN100LA4	96
72	276	1.4	19.5	5800	F302_19.5 S3 M3LA4	91	F302_19.5 P100 BN100LA4	92
72	275	3.6	19.5	10200	F502_19.5 S3 M3LA4	99	F502_19.5 P100 BN100LA4	100
75	266	2.6	18.8	7910	F402_18.8 S3 M3LA4	95	F402_18.8 P100 BN100LA4	96
93	214	1.8	15.1	5490	F302_15.1 S3 M3LA4	91	F302_15.1 P100 BN100LA4	92
94	213	3.3	15.1	7460	F402_15.1 S3 M3LA4	95	F402_15.1 P100 BN100LA4	96
95	209	1.0	14.8	2190	F202_14.8 S3 M3LA4	87	F202_14.8 P100 BN100LA4	88
118	169	2.2	12.0	5190	F302_12.0 S3 M3LA4	91	F302_12.0 P100 BN100LA4	92
126	159	1.1	11.2	2060	F202_11.2 S3 M3LA4	87	F202_11.2 P100 BN100LA4	88
139	143	1.3	20.2	2050	F202_20.2 S3 M3SA2	87	F202_20.2 P90 BN90L2	88
156	128	3.0	9.0	4830	F302_9.0 S3 M3LA4	91	F302_9.0 P100 BN100LA4	92
161	124	1.3	8.7	1960	F202_8.7 S3 M3LA4	87	F202_8.7 P100 BN100LA4	88
190	105	1.6	14.8	1920	F202_14.8 S3 M3SA2	87	F202_14.8 P90 BN90L2	88
192	104	0.9	14.6	1550	F102_14.6 S3 M3SA2	83	F102_14.6 P90 BN90L2	84
216	93	0.9	13.0	1500	F102_13.0 S3 M3SA2	83	F102_13.0 P90 BN90L2	84
220	91	1.4	6.4	1840	F202_6.4 S3 M3LA4	87	F202_6.4 P100 BN100LA4	88
250	80	1.8	11.2	1780	F202_11.2 S3 M3SA2	87	F202_11.2 P90 BN90L2	88
288	69	1.1	9.8	1410	F102_9.8 S3 M3SA2	83	F102_9.8 P90 BN90L2	84
322	62	2.0	8.7	1670	F202_8.7 S3 M3SA2	87	F202_8.7 P90 BN90L2	88
380	53	1.2	7.4	1330	F102_7.4 S3 M3SA2	83	F102_7.4 P90 BN90L2	84



3 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
1.8	14300	1.0	773.4	55000	F904_773.4 S3 M3LB4	115	F904_773.4 P100 BN100LB4	116
2.0	13202	1.1	714.0	55000	F904_714.0 S3 M3LB4	115	F904_714.0 P100 BN100LB4	116
2.3	11568	1.2	625.6	55000	F904_625.6 S3 M3LB4	115	F904_625.6 P100 BN100LB4	116
2.4	10678	1.3	577.5	55000	F904_577.5 S3 M3LB4	115	F904_577.5 P100 BN100LB4	116
2.8	9164	1.5	495.6	55000	F904_495.6 S3 M3LB4	115	F904_495.6 P100 BN100LB4	116
2.9	9044	0.9	489.1	45000	F804_489.1 S3 M3LB4	111	F804_489.1 P100 BN100LB4	112
3.1	8459	1.7	457.5	55000	F904_457.5 S3 M3LB4	115	F904_457.5 P100 BN100LB4	116
3.1	8348	1.0	451.5	45000	F804_451.5 S3 M3LB4	111	F804_451.5 P100 BN100LB4	112
3.6	7248	1.9	392.0	55000	F904_392.0 S3 M3LB4	115	F904_392.0 P100 BN100LB4	116
3.7	7086	1.1	383.2	45000	F804_383.2 S3 M3LB4	111	F804_383.2 P100 BN100LB4	112
3.9	6690	2.1	361.8	55000	F904_361.8 S3 M3LB4	115	F904_361.8 P100 BN100LB4	116
4.0	6540	1.2	353.7	45000	F804_353.7 S3 M3LB4	111	F804_353.7 P100 BN100LB4	112
4.6	5627	0.9	304.3	35000	F704_304.3 S3 M3LB4	107	F704_304.3 P100 BN100LB4	108
4.8	5486	1.5	296.7	45000	F804_296.7 S3 M3LB4	111	F804_296.7 P100 BN100LB4	112
4.8	5383	2.6	291.1	55000	F904_291.1 S3 M3LB4	115	F904_291.1 P100 BN100LB4	116
5.0	5194	1.0	280.9	35000	F704_280.9 S3 M3LB4	107	F704_280.9 P100 BN100LB4	108
5.1	5065	1.6	273.9	45000	F804_273.9 S3 M3LB4	111	F804_273.9 P100 BN100LB4	112
6.0	4338	1.2	234.6	35000	F704_234.6 S3 M3LB4	107	F704_234.6 P100 BN100LB4	108
6.1	4279	3.3	231.4	55000	F904_231.4 S3 M3LB4	115	F904_231.4 P100 BN100LB4	116
6.1	4361	1.1	153.8	35000	F703_153.8 S4 M4SA6	103	F703_153.8 P132 BN132S6	108
6.5	4040	2.0	218.5	45000	F804_218.5 S3 M3LB4	111	F804_218.5 P100 BN100LB4	112
6.5	4003	1.2	216.5	35000	F704_216.5 S3 M3LB4	107	F704_216.5 P100 BN100LB4	108
7.1	3779	2.1	200.0	45000			F803_200.0 P100 BN100LB4	112
7.2	3704	1.3	196.0	35000	F703_196.0 S3 M3LB4	103	F703_196.0 P100 BN100LB4	108
7.6	3489	2.3	184.6	45000			F803_184.6 P100 BN100LB4	112
7.8	3419	1.5	180.9	35000	F703_180.9 S3 M3LB4	103	F703_180.9 P100 BN100LB4	108
8.5	3149	1.6	166.7	35000	F703_166.7 S3 M3LB4	103	F703_166.7 P100 BN100LB4	108
8.7	3078	0.9	162.9	20000	F603_162.9 S3 M3LB4	103	F603_162.9 P100 BN100LB4	104
8.8	3028	2.6	160.2	45000			F803_160.2 P100 BN100LB4	112
9.2	2907	1.7	153.8	35000	F703_153.8 S3 M3LB4	103	F703_153.8 P100 BN100LB4	108
9.4	2841	1.0	150.4	20000	F603_150.4 S3 M3LB4	103	F603_150.4 P100 BN100LB4	104
9.5	2795	2.9	147.9	45000			F803_147.9 P100 BN100LB4	112
10.6	2512	2.0	133.0	35000	F703_133.0 S3 M3LB4	103	F703_133.0 P100 BN100LB4	108
10.6	2507	3.2	132.7	45000			F803_132.7 P100 BN100LB4	112
10.8	2466	1.2	130.5	20000	F603_130.5 S3 M3LB4	103	F603_130.5 P100 BN100LB4	104
11.5	2319	2.2	122.7	35000	F703_122.7 S3 M3LB4	103	F703_122.7 P100 BN100LB4	108
11.5	2315	3.5	122.5	45000			F803_122.5 P100 BN100LB4	112
11.7	2276	1.3	120.5	20000	F603_120.5 S3 M3LB4	103	F603_120.5 P100 BN100LB4	104
12.9	2071	2.4	109.6	35000	F703_109.6 S3 M3LB4	103	F703_109.6 P100 BN100LB4	108
13.3	2010	1.4	106.4	20000	F603_106.4 S3 M3LB4	103	F603_106.4 P100 BN100LB4	104
13.9	1912	2.6	101.2	35000	F703_101.2 S3 M3LB4	103	F703_101.2 P100 BN100LB4	108
14.4	1856	1.6	98.2	20000	F603_98.2 S3 M3LB4	103	F603_98.2 P100 BN100LB4	104
16.5	1613	3.1	85.4	35000	F703_85.4 S3 M3LB4	103	F703_85.4 P100 BN100LB4	108
16.8	1588	1.8	84.0	20000	F603_84.0 S3 M3LB4	103	F603_84.0 P100 BN100LB4	104
16.9	1573	1.0	83.2	12000	F503_83.2 S3 M3LB4	99	F503_83.2 P100 BN100LB4	100
20.7	1290	2.2	68.3	20000	F603_68.3 S3 M3LB4	103	F603_68.3 P100 BN100LB4	104
21.4	1244	1.2	65.8	12000	F503_65.8 S3 M3LB4	99	F503_65.8 P100 BN100LB4	100
22.4	1191	2.4	63.0	20000	F603_63.0 S3 M3LB4	103	F603_63.0 P100 BN100LB4	104
27.2	979	3.0	51.8	20000	F603_51.8 S3 M3LB4	103	F603_51.8 P100 BN100LB4	104
28.8	924	1.5	48.9	12000	F503_48.9 S3 M3LB4	99	F503_48.9 P100 BN100LB4	100
36	734	1.6	38.9	11800	F503_38.9 S3 M3LB4	99	F503_38.9 P100 BN100LB4	100
37	717	1.0	37.9	8500	F403_37.9 S3 M3LB4	95	F403_37.9 P100 BN100LB4	96
46	592	1.5	30.7	11100	F502_30.7 S3 M3LB4	99	F502_30.7 P100 BN100LB4	100
47	578	1.1	29.9	8300	F402_29.9 S3 M3LB4	95	F402_29.9 P100 BN100LB4	96
59	464	2.2	24.0	10500	F502_24.0 S3 M3LB4	99	F502_24.0 P100 BN100LB4	100
59	460	1.5	23.8	7960	F402_23.8 S3 M3LB4	95	F402_23.8 P100 BN100LB4	96
72	376	1.0	19.5	5400	F302_19.5 S3 M3LB4	91	F302_19.5 P100 BN100LB4	92
72	375	2.7	19.5	9910	F502_19.5 S3 M3LB4	99	F502_19.5 P100 BN100LB4	100
75	363	1.9	18.8	7570	F402_18.8 S3 M3LB4	95	F402_18.8 P100 BN100LB4	96
82	333	1.1	35.0	5300	F302_35.0 S3 M3LA2	91	F302_35.0 P100 BN100L2	92
92	297	3.4	15.4	9300	F502_15.4 S3 M3LB4	99	F502_15.4 P100 BN100LB4	100
93	292	1.3	15.1	5180	F302_15.1 S3 M3LB4	91	F302_15.1 P100 BN100LB4	92
94	291	2.4	15.1	7190	F402_15.1 S3 M3LB4	95	F402_15.1 P100 BN100LB4	96
118	231	1.6	12.0	4940	F302_12.0 S3 M3LB4	91	F302_12.0 P100 BN100LB4	92
120	228	3.1	11.8	6770	F402_11.8 S3 M3LB4	95	F402_11.8 P100 BN100LB4	96
142	192	0.9	20.2	1890	F202_20.2 S3 M3LA2	87	F202_20.2 P100 BN100L2	88
147	185	2.1	19.5	4710	F302_19.5 S3 M3LA2	91	F302_19.5 P100 BN100L2	92

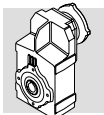


3 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
156	174	2.2	9.0	4650	F302_9.0 S3 M3LB4	91	F302_9.0 P100 BN100LB4	92
161	169	0.9	8.7	1820	F202_8.7 S3 M3LB4	87	F202_8.7 P100 BN100LB4	88
193	141	1.2	14.8	1800	F202_14.8 S3 M3LA2	87	F202_14.8 P100 BN100L2	88
203	134	2.8	6.9	4360	F302_6.9 S3 M3LB4	91	F302_6.9 P100 BN100LB4	92
220	124	1.1	6.4	1730	F202_6.4 S3 M3LB4	87	F202_6.4 P100 BN100LB4	88
255	107	1.3	11.2	1680	F202_11.2 S3 M3LA2	87	F202_11.2 P100 BN100L2	88
328	83	1.5	8.7	1600	F202_8.7 S3 M3LA2	87	F202_8.7 P100 BN100L2	88
446	61	1.7	6.4	1480	F202_6.4 S3 M3LA2	87	F202_6.4 P100 BN100L2	88

4 kW

2.2	15645	0.9	625.6	55000	F904_625.6 S3 M3LC4	115	F904_625.6 P112 BN112M4	116
2.4	14442	1.0	577.5	55000	F904_577.5 S3 M3LC4	115	F904_577.5 P112 BN112M4	116
2.8	12394	1.1	495.6	55000	F904_495.6 S3 M3LC4	115	F904_495.6 P112 BN112M4	116
3.0	11441	1.2	457.5	55000	F904_457.5 S3 M3LC4	115	F904_457.5 P112 BN112M4	116
3.5	9803	1.4	392.0	55000	F904_392.0 S3 M3LC4	115	F904_392.0 P112 BN112M4	116
3.8	9048	1.5	361.8	55000	F904_361.8 S3 M3LC4	115	F904_361.8 P112 BN112M4	116
3.9	8846	0.9	353.7	45000	F804_353.7 S3 M3LC4	111	F804_353.7 P112 BN112M4	112
4.7	7420	1.1	296.7	45000	F804_296.7 S3 M3LC4	111	F804_296.7 P112 BN112M4	112
4.8	7280	1.9	291.1	55000	F904_291.1 S3 M3LC4	115	F904_291.1 P112 BN112M4	116
5.1	6850	1.2	273.9	45000	F804_273.9 S3 M3LC4	111	F804_273.9 P112 BN112M4	112
5.2	6720	2.1	268.7	55000	F904_268.7 S3 M3LC4	115	F904_268.7 P112 BN112M4	116
5.9	5867	0.9	234.6	35000	F704_234.6 S3 M3LC4	107	F704_234.6 P112 BN112M4	108
6.0	5787	2.4	231.4	55000	F904_231.4 S3 M3LC4	115	F904_231.4 P112 BN112M4	116
6.4	5464	1.5	218.5	45000	F804_218.5 S3 M3LC4	111	F804_218.5 P112 BN112M4	112
6.4	5414	0.9	216.5	35000	F704_216.5 S3 M3LC4	107	F704_216.5 P112 BN112M4	108
6.5	5342	2.6	213.6	55000	F904_213.6 S3 M3LC4	115	F904_213.6 P112 BN112M4	116
7.0	5112	1.6	200.0	45000			F803_200.0 P112 BN112M4	112
7.1	5010	1.0	196.0	35000	F703_196.0 S3 M3LC4	103	F703_196.0 P112 BN112M4	108
7.2	4962	2.8	194.2	55000			F903_194.2 P112 BN112M4	116
7.5	4718	1.7	184.6	45000			F803_184.6 P112 BN112M4	112
7.7	4625	1.1	180.9	35000	F703_180.9 S3 M3LC4	103	F703_180.9 P112 BN112M4	108
7.8	4581	3.1	179.2	55000			F903_179.2 P112 BN112M4	116
8.3	4260	1.2	166.7	35000	F703_166.7 S3 M3LC4	103	F703_166.7 P112 BN112M4	108
8.5	4162	3.4	162.8	55000			F903_162.8 P112 BN112M4	116
8.7	4095	2.0	160.2	45000			F803_160.2 P112 BN112M4	112
9.0	3932	1.3	153.8	35000	F703_153.8 S3 M3LC4	103	F703_153.8 P112 BN112M4	108
9.4	3780	2.1	147.9	45000			F803_147.9 P112 BN112M4	112
10.5	3398	1.5	133.0	35000	F703_133.0 S3 M3LC4	103	F703_133.0 P112 BN112M4	108
10.5	3391	2.4	132.7	45000			F803_132.7 P112 BN112M4	112
11.3	3137	1.6	122.7	35000	F703_122.7 S3 M3LC4	103	F703_122.7 P112 BN112M4	108
11.3	3131	2.6	122.5	45000			F803_122.5 P112 BN112M4	112
11.5	3079	0.9	120.5	20000	F603_120.5 S3 M3LC4	103	F603_120.5 P112 BN112M4	104
12.2	2907	2.8	113.8	45000			F803_113.8 P112 BN112M4	112
12.7	2802	1.8	109.6	35000	F703_109.6 S3 M3LC4	103	F703_109.6 P112 BN112M4	108
13.1	2719	1.1	106.4	20000	F603_106.4 S3 M3LC4	103	F603_106.4 P112 BN112M4	104
13.2	2684	3.0	105.0	45000			F803_105.0 P112 BN112M4	112
13.7	2586	1.9	101.2	35000	F703_101.2 S3 M3LC4	103	F703_101.2 P112 BN112M4	108
14.2	2510	1.2	98.2	20000	F603_98.2 S3 M3LC4	103	F603_98.2 P112 BN112M4	104
15.0	2364	2.1	92.5	35000	F703_92.5 S3 M3LC4	103	F703_92.5 P112 BN112M4	108
16.3	2182	2.3	85.4	35000	F703_85.4 S3 M3LC4	103	F703_85.4 P112 BN112M4	108
16.5	2147	1.4	84.0	20000	F603_84.0 S3 M3LC4	103	F603_84.0 P112 BN112M4	104
17.9	1982	1.5	77.6	20000	F603_77.6 S3 M3LC4	103	F603_77.6 P112 BN112M4	104
20.4	1745	1.7	68.3	20000	F603_68.3 S3 M3LC4	103	F603_68.3 P112 BN112M4	104
22.1	1611	1.8	63.0	20000	F603_63.0 S3 M3LC4	103	F603_63.0 P112 BN112M4	104
26.8	1325	2.2	51.8	20000	F603_51.8 S3 M3LC4	103	F603_51.8 P112 BN112M4	104
28.4	1250	1.1	48.9	11500	F503_48.9 S3 M3LC4	99	F503_48.9 P112 BN112M4	100
29.1	1223	2.4	47.8	20000	F603_47.8 S3 M3LC4	103	F603_47.8 P112 BN112M4	104
36	993	1.2	38.9	11100	F503_38.9 S3 M3LC4	99	F503_38.9 P112 BN112M4	100
36	993	2.9	38.8	20000	F603_38.8 S3 M3LC4	103	F603_38.8 P112 BN112M4	104
43	823	1.0	66.5	7740	F403_66.5 S3 M3LB2	95	F403_66.5 P112 BN112M2	96
45	800	1.1	30.7	10600	F502_30.7 S3 M3LC4	99	F502_30.7 P112 BN112M4	100
55	650	2.9	25.4	20000	F603_25.4 S3 M3LC4	103	F603_25.4 P112 BN112M4	104
58	628	1.6	24.0	10100	F502_24.0 S3 M3LC4	99	F502_24.0 P112 BN112M4	100
58	623	1.1	23.8	7430	F402_23.8 S3 M3LC4	95	F402_23.8 P112 BN112M4	96
59	600	3.2	23.5	20000	F603_23.5 S3 M3LC4	103	F603_23.5 P112 BN112M4	104

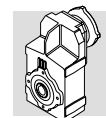


4 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
71	508	2.0	19.5	9600	F502_19.5 S3 M3LC4	99	F502_19.5 P112 BN112M4	100
74	491	1.4	18.8	7160	F402_18.8 S3 M3LC4	95	F402_18.8 P112 BN112M4	96
90	402	2.5	15.4	9070	F502_15.4 S3 M3LC4	99	F502_15.4 P112 BN112M4	100
92	395	1.0	15.1	4790	F302_15.1 S3 M3LC4	91	F302_15.1 P112 BN112M4	92
92	393	1.8	15.1	6870	F402_15.1 S3 M3LC4	95	F402_15.1 P112 BN112M4	96
114	318	3.1	12.2	8530	F502_12.2 S3 M3LC4	99	F502_12.2 P112 BN112M4	100
116	312	1.2	12.0	4640	F302_12.0 S3 M3LC4	91	F302_12.0 P112 BN112M4	92
118	308	2.3	11.8	6520	F402_11.8 S3 M3LC4	95	F402_11.8 P112 BN112M4	96
152	239	2.9	9.1	6150	F402_9.1 S3 M3LC4	95	F402_9.1 P112 BN112M4	96
154	235	1.6	9.0	4420	F302_9.0 S3 M3LC4	91	F302_9.0 P112 BN112M4	92
200	181	2.1	6.9	4200	F302_6.9 S3 M3LC4	91	F302_6.9 P112 BN112M4	92
207	176	3.4	6.7	5690	F402_6.7 S3 M3LC4	95	F402_6.7 P112 BN112M4	96
240	151	2.5	12.0	4030	F302_12.0 S3 M3LB2	91	F302_12.0 P112 BN112M2	92
255	142	1.0	11.2	1570	F202_11.2 S3 M3LB2	87	F202_11.2 P112 BN112M2	88
318	114	3.3	9.0	3760	F302_9.0 S3 M3LB2	91	F302_9.0 P112 BN112M2	92
329	110	1.1	8.7	1510	F202_8.7 S3 M3LB2	87	F202_8.7 P112 BN112M2	88
413	88	4.0	6.9	3510	F302_6.9 S3 M3LB2	91	F302_6.9 P112 BN112M2	92
448	81	1.3	6.4	1420	F202_6.4 S3 M3LB2	87	F202_6.4 P112 BN112M2	88

5.5 kW

2.9	16450	0.9	495.6	55000	F904_495.6 S4 M4SA4	115	F904_495.6 P132 BN132S4	116
3.1	15186	0.9	457.5	55000	F904_457.5 S4 M4SA4	115	F904_457.5 P132 BN132S4	116
3.7	13012	1.1	392.0	55000	F904_392.0 S4 M4SA4	115	F904_392.0 P132 BN132S4	116
4.0	12009	1.2	361.8	55000	F904_361.8 S4 M4SA4	115	F904_361.8 P132 BN132S4	116
4.9	9662	1.4	291.1	55000	F904_291.1 S4 M4SA4	115	F904_291.1 P132 BN132S4	116
5.3	9092	0.9	273.9	45000	F804_273.9 S4 M4SA4	111	F804_273.9 P132 BN132S4	112
5.4	8919	1.6	268.7	55000	F904_268.7 S4 M4SA4	115	F904_268.7 P132 BN132S4	116
6.2	7681	1.8	231.4	55000	F904_231.4 S4 M4SA4	115	F904_231.4 P132 BN132S4	116
6.6	7253	1.1	218.5	45000	F804_218.5 S4 M4SA4	111	F804_218.5 P132 BN132S4	112
6.7	7090	2.0	213.6	55000	F904_213.6 S4 M4SA4	115	F904_213.6 P132 BN132S4	116
7.2	6784	1.2	200.0	45000	F803_200.0 S4 M4SA4	111	F803_200.0 P132 BN132S4	112
7.4	6586	2.1	194.2	55000	F903_194.2 S4 M4SA4	115	F903_194.2 P132 BN132S4	116
7.8	6263	1.3	184.6	45000	F803_184.6 S4 M4SA4	111	F803_184.6 P132 BN132S4	112
8.0	6080	2.3	179.2	55000	F903_179.2 S4 M4SA4	115	F903_179.2 P132 BN132S4	116
8.8	5524	2.5	162.8	55000	F903_162.8 S4 M4SA4	115	F903_162.8 P132 BN132S4	116
9.0	5435	1.5	160.2	45000	F803_160.2 S4 M4SA4	111	F803_160.2 P132 BN132S4	112
9.4	5219	1.0	153.8	35000	F703_153.8 S4 M4SA4	103	F703_153.8 P132 BN132S4	108
9.6	5099	2.7	150.3	55000	F903_150.3 S4 M4SA4	115	F903_150.3 P132 BN132S4	116
9.7	5017	1.6	147.9	45000	F803_147.9 S4 M4SA4	111	F803_147.9 P132 BN132S4	112
10.5	4659	3.0	137.3	55000	F903_137.3 S4 M4SA4	115	F903_137.3 P132 BN132S4	116
10.8	4510	1.1	133.0	35000	F703_133.0 S4 M4SA4	103	F703_133.0 P132 BN132S4	108
10.9	4501	1.8	132.7	45000	F803_132.7 S4 M4SA4	111	F803_132.7 P132 BN132S4	112
11.4	4301	3.3	126.8	55000	F903_126.8 S4 M4SA4	115	F903_126.8 P132 BN132S4	116
11.7	4163	1.2	122.7	35000	F703_122.7 S4 M4SA4	103	F703_122.7 P132 BN132S4	108
11.8	4155	1.9	122.5	45000	F803_122.5 S4 M4SA4	111	F803_122.5 P132 BN132S4	112
12.7	3859	2.1	113.8	45000	F803_113.8 S4 M4SA4	111	F803_113.8 P132 BN132S4	112
13.1	3718	1.3	109.6	35000	F703_109.6 S4 M4SA4	103	F703_109.6 P132 BN132S4	108
13.7	3562	2.2	105.0	45000	F803_105.0 S4 M4SA4	111	F803_105.0 P132 BN132S4	112
14.2	3432	1.5	101.2	35000	F703_101.2 S4 M4SA4	103	F703_101.2 P132 BN132S4	108
15.6	3138	1.6	92.5	35000	F703_92.5 S4 M4SA4	103	F703_92.5 P132 BN132S4	108
15.6	3131	2.6	92.3	45000	F803_92.3 S4 M4SA4	111	F803_92.3 P132 BN132S4	112
16.9	2896	1.7	85.4	35000	F703_85.4 S4 M4SA4	103	F703_85.4 P132 BN132S4	108
16.9	2890	2.8	85.2	45000	F803_85.2 S4 M4SA4	111	F803_85.2 P132 BN132S4	112
17.1	2850	1.0	84.0	20000	F603_84.0 S4 M4SA4	103	F603_84.0 P132 BN132S4	104
18.6	2631	1.1	77.6	20000	F603_77.6 S4 M4SA4	103	F603_77.6 P132 BN132S4	104
18.9	2587	3.1	76.3	45000	F803_76.3 S4 M4SA4	111	F803_76.3 P132 BN132S4	112
19.6	2495	2.0	73.6	35000	F703_73.6 S4 M4SA4	103	F703_73.6 P132 BN132S4	108
20.5	2388	3.4	70.4	45000	F803_70.4 S4 M4SA4	111	F803_70.4 P132 BN132S4	112
21.1	2316	1.3	68.3	20000	F603_68.3 S4 M4SA4	103	F603_68.3 P132 BN132S4	104
21.2	2303	2.2	67.9	35000	F703_67.9 S4 M4SA4	103	F703_67.9 P132 BN132S4	108
22.8	2138	1.4	63.0	20000	F603_63.0 S4 M4SA4	103	F603_63.0 P132 BN132S4	104
23.0	2120	2.4	62.5	35000	F703_62.5 S4 M4SA4	103	F703_62.5 P132 BN132S4	108
25.0	1957	2.6	57.7	35000	F703_57.7 S4 M4SA4	103	F703_57.7 P132 BN132S4	108
27.8	1758	1.6	51.8	20000	F603_51.8 S4 M4SA4	103	F603_51.8 P132 BN132S4	104
29.4	1661	3.0	49.0	35000	F703_49.0 S4 M4SA4	103	F703_49.0 P132 BN132S4	108

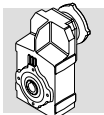


5.5 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
30	1623	1.8	47.8	20000	F603_47.8 S4 M4SA4	103	F603_47.8 P132 BN132S4	104
32	1533	3.3	45.2	34300	F703_45.2 S4 M4SA4	103	F703_45.2 P132 BN132S4	108
34	1428	2.0	42.1	20000	F603_42.1 S4 M4SA4	103	F603_42.1 P132 BN132S4	104
37	1318	0.9	38.9	10100	F503_38.9 S4 M4SA4	99	F503_38.9 P132 BN132S4	100
37	1318	2.2	38.8	20000	F603_38.8 S4 M4SA4	103	F603_38.8 P132 BN132S4	104
45	1088	2.7	32.1	20000	F603_32.1 S4 M4SA4	103	F603_32.1 P132 BN132S4	104
46	1068	1.8	20.7	20000	F603_20.7 S4 M4LB6	103	F603_20.7 P132 BN132MB6	104
49	1005	2.9	29.6	20000	F603_29.6 S4 M4SA4	103	F603_29.6 P132 BN132S4	104
57	862	2.2	25.4	20000	F603_25.4 S4 M4SA4	103	F603_25.4 P132 BN132S4	104
60	833	1.2	24.0	9400	F502_24.0 S4 M4SA4	99	F502_24.0 P132 BN132S4	100
61	796	2.4	23.5	20000	F603_23.5 S4 M4SA4	103	F603_23.5 P132 BN132S4	104
70	701	2.7	20.7	20000	F603_20.7 S4 M4SA4	103	F603_20.7 P132 BN132S4	104
74	674	1.5	19.5	9020	F502_19.5 S4 M4SA4	99	F502_19.5 P132 BN132S4	100
76	647	2.9	19.1	20000	F603_19.1 S4 M4SA4	103	F603_19.1 P132 BN132S4	104
77	652	1.1	18.8	6500	F402_18.8 S4 M4SA4	95	F402_18.8 P132 BN132S4	96
93	534	1.4	15.4	8590	F502_15.4 S4 M4SA4	99	F502_15.4 P132 BN132S4	100
96	522	1.3	15.1	6320	F402_15.1 S4 M4SA4	95	F402_15.1 P132 BN132S4	96
103	482	1.5	9.1	6250	F402_9.1 S4 M4LB6	95	F402_9.1 P132 BN132MB6	96
118	422	2.4	12.2	8140	F502_12.2 S4 M4SA4	99	F502_12.2 P132 BN132S4	100
122	409	1.7	11.8	6080	F402_11.8 S4 M4SA4	95	F402_11.8 P132 BN132S4	96
140	355	1.7	6.7	5930	F402_6.7 S4 M4LB6	95	F402_6.7 P132 BN132MB6	96
158	317	2.2	9.1	5790	F402_9.1 S4 M4SA4	95	F402_9.1 P132 BN132S4	96
159	314	3.2	9.1	7560	F502_9.1 S4 M4SA4	99	F502_9.1 P132 BN132S4	100
192	260	2.7	15.1	5550	F402_15.1 S4 M4SA2	95	F402_15.1 P132 BN132SA2	96
214	233	2.6	6.7	5420	F402_6.7 S4 M4SA4	95	F402_6.7 P132 BN132S4	96
245	204	3.2	11.8	5240	F402_11.8 S4 M4SA2	95	F402_11.8 P132 BN132SA2	96
316	158	3.6	9.1	4920	F402_9.1 S4 M4SA2	95	F402_9.1 P132 BN132SA2	96
431	116	4.1	6.7	4530	F402_6.7 S4 M4SA2	95	F402_6.7 P132 BN132SA2	96

7.5 kW

4.0	16376	0.9	361.8	55000	F904_361.8 S4 M4LA4	115	F904_361.8 P132 BN132MA4	116
4.9	13176	1.1	291.1	55000	F904_291.1 S4 M4LA4	115	F904_291.1 P132 BN132MA4	116
5.4	12162	1.2	268.7	55000	F904_268.7 S4 M4LA4	115	F904_268.7 P132 BN132MA4	116
6.2	10474	1.3	231.4	55000	F904_231.4 S4 M4LA4	115	F904_231.4 P132 BN132MA4	116
6.7	9668	1.4	213.6	55000	F904_213.6 S4 M4LA4	115	F904_213.6 P132 BN132MA4	116
7.4	8981	1.6	194.2	55000	F903_194.2 S4 M4LA4	115	F903_194.2 P132 BN132MA4	116
7.8	8540	0.9	184.6	45000	F803_184.6 S4 M4LA4	111	F803_184.6 P132 BN132MA4	112
8.0	8290	1.7	179.2	55000	F903_179.2 S4 M4LA4	115	F903_179.2 P132 BN132MA4	116
8.8	7532	1.9	162.8	55000	F903_162.8 S4 M4LA4	115	F903_162.8 P132 BN132MA4	116
9.0	7412	1.1	160.2	45000	F803_160.2 S4 M4LA4	111	F803_160.2 P132 BN132MA4	112
9.6	6953	2.0	150.3	55000	F903_150.3 S4 M4LA4	115	F903_150.3 P132 BN132MA4	116
9.7	6842	1.2	147.9	45000	F803_147.9 S4 M4LA4	111	F803_147.9 P132 BN132MA4	112
10.5	6353	2.2	137.3	55000	F903_137.3 S4 M4LA4	115	F903_137.3 P132 BN132MA4	116
10.9	6138	1.3	132.7	45000	F803_132.7 S4 M4LA4	111	F803_132.7 P132 BN132MA4	112
11.4	5864	2.4	126.8	55000	F903_126.8 S4 M4LA4	115	F903_126.8 P132 BN132MA4	116
11.8	5666	1.4	122.5	45000	F803_122.5 S4 M4LA4	111	F803_122.5 P132 BN132MA4	112
12.7	5262	1.5	113.8	45000	F803_113.8 S4 M4LA4	111	F803_113.8 P132 BN132MA4	112
12.9	5178	2.7	111.9	55000	F903_111.9 S4 M4LA4	115	F903_111.9 P132 BN132MA4	116
13.1	5071	1.0	109.6	35000	F703_109.6 S4 M4LA4	103	F703_109.6 P132 BN132MA4	108
13.7	4857	1.6	105.0	45000	F803_105.0 S4 M4LA4	111	F803_105.0 P132 BN132MA4	112
13.9	4780	2.9	103.3	55000	F903_103.3 S4 M4LA4	115	F903_103.3 P132 BN132MA4	116
14.2	4681	1.1	101.2	35000	F703_101.2 S4 M4LA4	103	F703_101.2 P132 BN132MA4	108
15.0	4430	3.2	95.8	55000	F903_95.8 S4 M4LA4	115	F903_95.8 P132 BN132MA4	116
15.6	4279	1.2	92.5	35000	F703_92.5 S4 M4LA4	103	F703_92.5 P132 BN132MA4	108
15.6	4270	1.9	92.3	45000	F803_92.3 S4 M4LA4	111	F803_92.3 P132 BN132MA4	112
16.3	4089	3.4	88.4	55000	F903_88.4 S4 M4LA4	115	F903_88.4 P132 BN132MA4	116
16.9	3950	1.3	85.4	35000	F703_85.4 S4 M4LA4	103	F703_85.4 P132 BN132MA4	108
16.9	3941	2.0	85.2	45000	F803_85.2 S4 M4LA4	111	F803_85.2 P132 BN132MA4	112
18.9	3527	2.3	76.3	45000	F803_76.3 S4 M4LA4	111	F803_76.3 P132 BN132MA4	112
19.6	3403	1.5	73.6	35000	F703_73.6 S4 M4LA4	103	F703_73.6 P132 BN132MA4	108
20.5	3256	2.5	70.4	44700	F803_70.4 S4 M4LA4	111	F803_70.4 P132 BN132MA4	112
21.1	3158	0.9	68.3	20000	F603_68.3 S4 M4LA4	103	F603_68.3 P132 BN132MA4	104
21.2	3141	1.6	67.9	35000	F703_67.9 S4 M4LA4	103	F703_67.9 P132 BN132MA4	108
23.0	2891	1.7	62.5	35000	F703_62.5 S4 M4LA4	103	F703_62.5 P132 BN132MA4	108

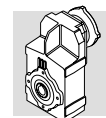


7.5 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
23.4	2843	2.8	61.5	43500	F803_61.5 S4 M4LA4	111	F803_61.5 P132 BN132MA4	112
25.0	2669	1.9	57.7	34900	F703_57.7 S4 M4LA4	103	F703_57.7 P132 BN132MA4	108
25.4	2624	3.0	56.7	42600	F803_56.7 S4 M4LA4	111	F803_56.7 P132 BN132MA4	112
27.8	2397	1.2	51.8	20000	F603_51.8 S4 M4LA4	103	F603_51.8 P132 BN132MA4	104
29.4	2265	2.2	49.0	33800	F703_49.0 S4 M4LA4	103	F703_49.0 P132 BN132MA4	108
30	2213	1.3	47.8	20000	F603_47.8 S4 M4LA4	103	F603_47.8 P132 BN132MA4	104
32	2090	2.4	45.2	33200	F703_45.2 S4 M4LA4	103	F703_45.2 P132 BN132MA4	108
34	1947	1.5	42.1	20000	F603_42.1 S4 M4LA4	103	F603_42.1 P132 BN132MA4	104
37	1797	1.6	38.8	20000	F603_38.8 S4 M4LA4	103	F603_38.8 P132 BN132MA4	104
45	1484	2.0	32.1	20000	F603_32.1 S4 M4LA4	103	F603_32.1 P132 BN132MA4	104
49	1370	2.1	29.6	20000	F603_29.6 S4 M4LA4	103	F603_29.6 P132 BN132MA4	104
57	1176	1.6	25.4	20000	F603_25.4 S4 M4LA4	103	F603_25.4 P132 BN132MA4	104
59	1136	3.5	24.6	28800	F703_24.6 S4 M4LA4	103	F703_24.6 P132 BN132MA4	108
61	1085	1.8	23.5	20000	F603_23.5 S4 M4LA4	103	F603_23.5 P132 BN132MA4	104
70	956	2.0	20.7	20000	F603_20.7 S4 M4LA4	103	F603_20.7 P132 BN132MA4	104
76	882	1.7	19.1	20000	F603_19.1 S4 M4LA4	103	F603_19.1 P132 BN132MA4	104
92	725	2.6	15.7	20000	F603_15.7 S4 M4LA4	103	F603_15.7 P132 BN132MA4	104
93	728	1.4	15.4	8060	F502_15.4 S4 M4LA4	99	F502_15.4 P132 BN132MA4	100
96	712	1.0	15.1	5660	F402_15.1 S4 M4LA4	95	F402_15.1 P132 BN132MA4	96
99	670	2.8	14.5	20000	F603_14.5 S4 M4LA4	103	F603_14.5 P132 BN132MA4	104
113	589	3.2	12.7	19900	F603_12.7 S4 M4LA4	103	F603_12.7 P132 BN132MA4	104
118	576	1.7	12.2	7720	F502_12.2 S4 M4LA4	99	F502_12.2 P132 BN132MA4	100
122	557	1.3	11.8	5560	F402_11.8 S4 M4LA4	95	F402_11.8 P132 BN132MA4	96
123	544	3.5	11.8	19500	F603_11.8 S4 M4LA4	103	F603_11.8 P132 BN132MA4	104
158	432	1.6	9.1	5390	F402_9.1 S4 M4LA4	95	F402_9.1 P132 BN132MA4	96
159	428	2.3	9.1	7240	F502_9.1 S4 M4LA4	99	F502_9.1 P132 BN132MA4	100
200	340	2.8	7.2	6860	F502_7.2 S4 M4LA4	99	F502_7.2 P132 BN132MA4	100
214	318	1.5	6.7	5120	F402_6.7 S4 M4LA4	95	F402_6.7 P132 BN132MA4	96
246	277	2.4	11.8	4980	F402_11.8 S4 M4SB2	95	F402_11.8 P132 BN132SB2	96
317	214	2.7	9.1	4710	F402_9.1 S4 M4SB2	95	F402_9.1 P132 BN132SB2	96
431	158	3.1	6.7	4380	F402_6.7 S4 M4SB2	95	F402_6.7 P132 BN132SB2	96

9.2 kW

4.9	16163	0.9	291.1	55000	F904_291.1 S4 M4LB4	115	F904_291.1 P132 BN132MB4	116
5.4	14919	0.9	268.7	55000	F904_268.7 S4 M4LB4	115	F904_268.7 P132 BN132MB4	116
6.2	12848	1.1	231.4	55000	F904_231.4 S4 M4LB4	115	F904_231.4 P132 BN132MB4	116
6.7	11860	1.2	213.6	55000	F904_213.6 S4 M4LB4	115	F904_213.6 P132 BN132MB4	116
7.4	11017	1.3	194.2	55000	F903_194.2 S4 M4LB4	115	F903_194.2 P132 BN132MB4	116
8.0	10169	1.4	179.2	55000	F903_179.2 S4 M4LB4	115	F903_179.2 P132 BN132MB4	116
8.8	9239	1.5	162.8	55000	F903_162.8 S4 M4LB4	115	F903_162.8 P132 BN132MB4	116
9.6	8529	1.6	150.3	55000	F903_150.3 S4 M4LB4	115	F903_150.3 P132 BN132MB4	116
9.7	8392	1.0	147.9	45000	F803_147.9 S4 M4LB4	111	F803_147.9 P132 BN132MB4	112
10.5	7793	1.8	137.3	55000	F903_137.3 S4 M4LB4	115	F903_137.3 P132 BN132MB4	116
10.9	7529	1.1	132.7	45000	F803_132.7 S4 M4LB4	111	F803_132.7 P132 BN132MB4	112
11.4	7194	1.9	126.8	55000	F903_126.8 S4 M4LB4	115	F903_126.8 P132 BN132MB4	116
11.8	6950	1.2	122.5	45000	F803_122.5 S4 M4LB4	111	F803_122.5 P132 BN132MB4	112
12.7	6455	1.2	113.8	45000	F803_113.8 S4 M4LB4	111	F803_113.8 P132 BN132MB4	112
12.9	6352	2.2	111.9	55000	F903_111.9 S4 M4LB4	115	F903_111.9 P132 BN132MB4	116
13.7	5958	1.3	105.0	45000	F803_105.0 S4 M4LB4	111	F803_105.0 P132 BN132MB4	112
13.9	5864	2.4	103.3	55000	F903_103.3 S4 M4LB4	115	F903_103.3 P132 BN132MB4	116
15.0	5434	2.6	95.8	55000	F903_95.8 S4 M4LB4	115	F903_95.8 P132 BN132MB4	116
15.6	5249	1.0	92.5	35000	F703_92.5 S4 M4LB4	103	F703_92.5 P132 BN132MB4	108
15.6	5238	1.5	92.3	45000	F803_92.3 S4 M4LB4	111	F803_92.3 P132 BN132MB4	112
16.3	5016	2.8	88.4	55000	F903_88.4 S4 M4LB4	115	F903_88.4 P132 BN132MB4	116
16.9	4845	1.0	85.4	35000	F703_85.4 S4 M4LB4	103	F703_85.4 P132 BN132MB4	108
16.9	4835	1.7	85.2	45000	F803_85.2 S4 M4LB4	111	F803_85.2 P132 BN132MB4	112
19.6	4174	1.2	73.6	35000	F703_73.6 S4 M4LB4	103	F703_73.6 P132 BN132MB4	108
20.4	4015	3.5	70.8	55000	F903_70.8 S4 M4LB4	115	F903_70.8 P132 BN132MB4	116
20.5	3994	2.0	70.4	43700	F803_70.4 S4 M4LB4	111	F803_70.4 P132 BN132MB4	112
21.2	3853	1.3	67.9	34600	F703_67.9 S4 M4LB4	103	F703_67.9 P132 BN132MB4	108
23.0	3546	1.4	62.5	34200	F703_62.5 S4 M4LB4	103	F703_62.5 P132 BN132MB4	108
23.4	3487	2.3	61.5	42200	F803_61.5 S4 M4LB4	111	F803_61.5 P132 BN132MB4	112
25.0	3274	1.5	57.7	33700	F703_57.7 S4 M4LB4	103	F703_57.7 P132 BN132MB4	108

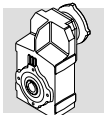


9.2 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
25.4	3219	2.5	56.7	41400	F803_56.7 S4 M4LB4	111	F803_56.7 P132 BN132MB4	112
27.8	2941	1.0	51.8	20000	F603_51.8 S4 M4LB4	103	F603_51.8 P132 BN132MB4	104
29.4	2778	1.8	49.0	32800	F703_49.0 S4 M4LB4	103	F703_49.0 P132 BN132MB4	108
30	2715	1.1	47.8	20000	F603_47.8 S4 M4LB4	103	F603_47.8 P132 BN132MB4	104
32	2564	1.9	45.2	32300	F703_45.2 S4 M4LB4	103	F703_45.2 P132 BN132MB4	108
34	2388	1.2	42.1	20000	F603_42.1 S4 M4LB4	103	F603_42.1 P132 BN132MB4	104
37	2204	1.3	38.8	20000	F603_38.8 S4 M4LB4	103	F603_38.8 P132 BN132MB4	104
45	1821	1.6	32.1	20000	F603_32.1 S4 M4LB4	103	F603_32.1 P132 BN132MB4	104
49	1680	1.7	29.6	20000	F603_29.6 S4 M4LB4	103	F603_29.6 P132 BN132MB4	104
57	1442	1.2	25.4	20000	F603_25.4 S4 M4LB4	103	F603_25.4 P132 BN132MB4	104
59	1393	2.9	24.6	28300	F703_24.6 S4 M4LB4	103	F703_24.6 P132 BN132MB4	108
61	1331	1.4	23.5	20000	F603_23.5 S4 M4LB4	103	F603_23.5 P132 BN132MB4	104
64	1283	3.4	22.6	27800	F703_22.6 S4 M4LB4	103	F703_22.6 P132 BN132MB4	108
69	1184	3.4	20.9	27200	F703_20.9 S4 M4LB4	103	F703_20.9 P132 BN132MB4	108
70	1172	1.6	20.7	20000	F603_20.7 S4 M4LB4	103	F603_20.7 P132 BN132MB4	104
76	1082	1.8	19.1	20000	F603_19.1 S4 M4LB4	103	F603_19.1 P132 BN132MB4	104
92	890	2.1	15.7	20000	F603_15.7 S4 M4LB4	103	F603_15.7 P132 BN132MB4	104
93	893	1.1	15.4	7600	F502_15.4 S4 M4LB4	99	F502_15.4 P132 BN132MB4	100
99	821	2.3	14.5	20000	F603_14.5 S4 M4LB4	103	F603_14.5 P132 BN132MB4	104
113	722	2.6	12.7	19700	F603_12.7 S4 M4LB4	103	F603_12.7 P132 BN132MB4	104
118	706	1.4	12.2	7360	F502_12.2 S4 M4LB4	99	F502_12.2 P132 BN132MB4	100
122	684	1.0	11.8	5120	F402_11.8 S4 M4LB4	95	F402_11.8 P132 BN132MB4	96
123	667	2.8	11.8	19300	F603_11.8 S4 M4LB4	103	F603_11.8 P132 BN132MB4	104
148	551	3.4	9.7	18400	F603_9.7 S4 M4LB4	103	F603_9.7 P132 BN132MB4	104
158	530	1.3	9.1	5050	F402_9.1 S4 M4LB4	95	F402_9.1 P132 BN132MB4	96
159	525	1.9	9.1	6980	F502_9.1 S4 M4LB4	99	F502_9.1 P132 BN132MB4	100
161	508	2.3	9.0	17900	F603_9.0 S4 M4LB4	103	F603_9.0 P132 BN132MB4	104
200	417	2.3	7.2	6650	F502_7.2 S4 M4LB4	99	F502_7.2 P132 BN132MB4	100
214	390	1.5	6.7	4870	F402_6.7 S4 M4LB4	95	F402_6.7 P132 BN132MB4	96
238	351	2.7	12.2	6400	F502_12.2 S4 M4LA2	99	F502_12.2 P132 BN132M2	100
246	340	1.9	11.8	4760	F402_11.8 S4 M4LA2	95	F402_11.8 P132 BN132M2	96
317	263	2.2	9.1	4540	F402_9.1 S4 M4LA2	95	F402_9.1 P132 BN132M2	96
320	261	3.3	9.1	5950	F502_9.1 S4 M4LA2	99	F502_9.1 P132 BN132M2	100
431	194	2.5	6.7	4260	F402_6.7 S4 M4LA2	95	F402_6.7 P132 BN132M2	96

11 kW

6.2	15362	0.9	231.4	55000	F904_231.4 S4 M4LC4	115	F904_231.4 P160 BN160MR	116
6.7	14180	1.0	213.6	55000	F904_213.6 S4 M4LC4	115	F904_213.6 P160 BN160MR	116
7.4	13172	1.1	194.2	55000	F903_194.2 S4 M4LC4	115	F903_194.2 P160 BN160M4	116
8.0	12159	1.2	179.2	55000	F903_179.2 S4 M4LC4	115	F903_179.2 P160 BN160M4	116
8.8	11047	1.3	162.8	55000	F903_162.8 S4 M4LC4	115	F903_162.8 P160 BN160M4	116
9.6	10197	1.4	150.3	55000	F903_150.3 S4 M4LC4	115	F903_150.3 P160 BN160M4	116
10.5	9318	1.5	137.3	55000	F903_137.3 S4 M4LC4	115	F903_137.3 P160 BN160M4	116
11.4	8601	1.6	126.8	55000	F903_126.8 S4 M4LC4	115	F903_126.8 P160 BN160M4	116
11.8	8310	1.0	122.5	45000	F803_122.5 S4 M4LC4	111	F803_122.5 P160 BN160M4	112
12.7	7717	1.0	113.8	45000	F803_113.8 S4 M4LC4	111	F803_113.8 P160 BN160M4	112
12.9	7595	1.8	111.9	55000	F903_111.9 S4 M4LC4	115	F903_111.9 P160 BN160M4	116
13.7	7124	1.1	105.0	45000	F803_105.0 S4 M4LC4	111	F803_105.0 P160 BN160M4	112
13.9	7011	2.0	103.3	55000	F903_103.3 S4 M4LC4	115	F903_103.3 P160 BN160M4	116
15.0	6497	2.2	95.8	55000	F903_95.8 S4 M4LC4	115	F903_95.8 P160 BN160M4	116
15.6	6263	1.3	92.3	44100	F803_92.3 S4 M4LC4	111	F803_92.3 P160 BN160M4	112
16.3	5997	2.3	88.4	55000	F903_88.4 S4 M4LC4	115	F903_88.4 P160 BN160M4	116
16.9	5781	1.4	85.2	44000	F803_85.2 S4 M4LC4	111	F803_85.2 P160 BN160M4	112
18.8	5200	2.7	76.7	55000	F903_76.7 S4 M4LC4	115	F903_76.7 P160 BN160M4	116
18.9	5173	1.5	76.3	42800	F803_76.3 S4 M4LC4	111	F803_76.3 P160 BN160M4	112
20.4	4800	2.9	70.8	55000	F903_70.8 S4 M4LC4	115	F903_70.8 P160 BN160M4	116
20.5	4775	1.7	70.4	42500	F803_70.4 S4 M4LC4	111	F803_70.4 P160 BN160M4	112
21.2	4607	1.1	67.9	33100	F703_67.9 S4 M4LC4	103	F703_67.9 P160 BN160M4	108
23.0	4240	1.2	62.5	32900	F703_62.5 S4 M4LC4	103	F703_62.5 P160 BN160M4	108
23.2	4213	3.3	62.1	55000	F903_62.1 S4 M4LC4	115	F903_62.1 P160 BN160M4	116
23.4	4170	1.9	61.5	41100	F803_61.5 S4 M4LC4	111	F803_61.5 P160 BN160M4	112
25.0	3914	1.3	57.7	32500	F703_57.7 S4 M4LC4	103	F703_57.7 P160 BN160M4	108
25.4	3849	2.1	56.7	40800	F803_56.7 S4 M4LC4	111	F803_56.7 P160 BN160M4	112

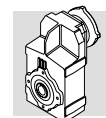


11 kW

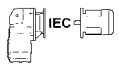
n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
29.3	3332	2.4	49.1	39300		111	F803_49.1 P160 BN160M4	112
29.4	3322	1.5	49.0	31800	F703_49.0 S4 M4LC4	103	F703_49.0 P160 BN160M4	108
32	3075	2.6	45.3	38900			F803_45.3 P160 BN160M4	112
32	3066	1.6	45.2	31300	F703_45.2 S4 M4LC4	103	F703_45.2 P160 BN160M4	108
34	2855	1.0	42.1	20000	F603_42.1 S4 M4LC4	103	F603_42.1 P160 BN160M4	104
37	2646	3.0	39.0	37400			F803_39.0 P160 BN160M4	112
37	2636	1.1	38.8	20000	F603_38.8 S4 M4LC4	103	F603_38.8 P160 BN160M4	104
38	2605	1.9	38.4	30500			F703_38.4 P160 BN160M4	108
40	2442	3.3	36.0	36900			F803_36.0 P160 BN160M4	112
41	2404	2.1	35.4	30000			F703_35.4 P160 BN160M4	108
45	2177	1.3	32.1	20000	F603_32.1 S4 M4LC4	103	F603_32.1 P160 BN160M4	104
48	2035	2.5	30.0	29000			F703_30.0 P160 BN160M4	108
49	2009	1.4	29.6	20000	F603_29.6 S4 M4LC4	103	F603_29.6 P160 BN160M4	104
52	1879	2.5	27.7	28500			F703_27.7 P160 BN160M4	108
57	1725	1.0	25.4	20000	F603_25.4 S4 M4LC4	103	F603_25.4 P160 BN160M4	104
59	1666	2.4	24.6	27800	F703_24.6 S4 M4LC4	103	F703_24.6 P160 BN160M4	108
61	1592	1.2	23.5	20000	F603_23.5 S4 M4LC4	103	F603_23.5 P160 BN160M4	104
64	1534	2.8	22.6	27300	F703_22.6 S4 M4LC4	103	F703_22.6 P160 BN160M4	108
69	1416	2.8	20.9	26800	F703_20.9 S4 M4LC4	103	F703_20.9 P160 BN160M4	108
70	1402	1.4	20.7	20000	F603_20.7 S4 M4LC4	103	F603_20.7 P160 BN160M4	104
76	1294	1.5	19.1	20000	F603_19.1 S4 M4LC4	103	F603_19.1 P160 BN160M4	104
92	1064	1.8	15.7	20000	F603_15.7 S4 M4LC4	103	F603_15.7 P160 BN160M4	104
99	982	1.9	14.5	20000	F603_14.5 S4 M4LC4	103	F603_14.5 P160 BN160M4	104
113	864	2.2	12.7	19400	F603_12.7 S4 M4LC4	103	F603_12.7 P160 BN160M4	104
118	845	1.2	12.2	6980	F502_12.2 S4 M4LC4	99	F502_12.2 P160 BN160M4	100
123	797	2.4	11.8	19000	F603_11.8 S4 M4LC4	103	F603_11.8 P160 BN160M4	104
148	659	2.9	9.7	18200	F603_9.7 S4 M4LC4	103	F603_9.7 P160 BN160M4	104
158	633	1.1	9.1	4680	F402_9.1 S4 M4LC4	95		
159	627	1.6	9.1	6700	F502_9.1 S4 M4LC4	99	F502_9.1 P160 BN160M4	100
161	608	3.1	9.0	17800	F603_9.0 S4 M4LC4	103	F603_9.0 P160 BN160M4	104
200	499	1.9	7.2	6430	F502_7.2 S4 M4LC4	99	F502_7.2 P160 BN160M4	100
214	466	1.3	6.7	4600	F402_6.7 S4 M4LC4	95		
240	417	2.2	12.2	6200	F502_12.2 S4 M4LC2	99	F502_12.2 P160 BN160MR2	100
248	403	1.6	11.8	4520	F402_11.8 S4 M4LC2	95		
320	312	1.8	9.1	4360	F402_9.1 S4 M4LC2	95		
323	309	2.7	9.1	5800	F502_9.1 S4 M4LC2	99	F502_9.1 P160 BN160MR2	100
406	246	3.2	7.2	5490	F502_7.2 S4 M4LC2	99	F502_7.2 P160 BN160MR2	100
434	230	2.1	6.7	4120	F402_6.7 S4 M4LC2	95		

15 kW

8.1	16353	0.9	179.2	55000	F903_179.2 S5 M5SB4	115	F903_179.2 P160 BN160L4	116
9.0	14858	0.9	162.8	55000	F903_162.8 S5 M5SB4	115	F903_162.8 P160 BN160L4	116
9.7	13715	1.0	150.3	55000	F903_150.3 S5 M5SB4	115	F903_150.3 P160 BN160L4	116
10.6	12532	1.1	137.3	55000	F903_137.3 S5 M5SB4	115	F903_137.3 P160 BN160L4	116
11.5	11568	1.2	126.8	55000	F903_126.8 S5 M5SB4	115	F903_126.8 P160 BN160L4	116
13.0	10215	1.4	111.9	55000	F903_111.9 S5 M5SB4	115	F903_111.9 P160 BN160L4	116
14.1	9429	1.5	103.3	55000	F903_103.3 S5 M5SB4	115	F903_103.3 P160 BN160L4	116
15.2	8738	1.6	95.8	55000	F903_95.8 S5 M5SB4	115	F903_95.8 P160 BN160L4	116
15.8	8423	0.9	92.3	41300	F803_92.3 S5 M5SB4	111	F803_92.3 P160 BN160L4	112
16.5	8066	1.7	88.4	55000	F903_88.4 S5 M5SB4	115	F903_88.4 P160 BN160L4	116
19.0	6994	2.0	76.7	55000	F903_76.7 S5 M5SB4	115	F903_76.7 P160 BN160L4	116
19.1	6958	1.1	76.3	40500	F803_76.3 S5 M5SB4	111	F803_76.3 P160 BN160L4	112
20.6	6456	2.2	70.8	55000	F903_70.8 S5 M5SB4	115	F903_70.8 P160 BN160L4	116
20.7	6422	1.2	70.4	39900	F803_70.4 S5 M5SB4	111	F803_70.4 P160 BN160L4	112
23.8	5608	1.4	61.5	38700	F803_61.5 S5 M5SB4	111	F803_61.5 P160 BN160L4	112
25.3	5264	0.9	57.7	29700	F703_57.7 S5 M5SB4	103	F703_57.7 P160 BN160L4	108
25.5	5231	2.7	57.3	55000	F903_57.3 S5 M5SB4	115	F903_57.3 P160 BN160L4	116
25.7	5177	1.5	56.7	38600	F803_56.7 S5 M5SB4	111	F803_56.7 P160 BN160L4	112
29.3	4553	3.1	49.9	55000	F903_49.9 S5 M5SB4	115	F903_49.9 P160 BN160L4	116
29.7	4481	1.8	49.1	37800	F803_49.1 S5 M5SB4	111	F803_49.1 P160 BN160L4	112
29.8	4467	1.1	49.0	29400	F703_49.0 S5 M5SB4	103	F703_49.0 P160 BN160L4	108

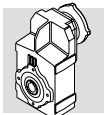


15 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
32	4203	3.3	46.1	55000	F903_46.1 S5 M5SB4	115	F903_46.1 P160 BN160L4	116
32	4136	1.9	45.3	37200	F803_45.3 S5 M5SB4	111	F803_45.3 P160 BN160L4	112
32	4124	1.2	45.2	29100	F703_45.2 S5 M5SB4	103	F703_45.2 P160 BN160L4	108
37	3559	2.2	39.0	36200	F803_39.0 S5 M5SB4	111	F803_39.0 P160 BN160L4	112
38	3503	1.4	38.4	28600	F703_38.4 S5 M5SB4	103	F703_38.4 P160 BN160L4	108
41	3285	2.4	36.0	35500	F803_36.0 S5 M5SB4	111	F803_36.0 P160 BN160L4	112
41	3234	1.5	35.4	28200	F703_35.4 S5 M5SB4	103	F703_35.4 P160 BN160L4	108
46	2928	1.0	32.1	20000	F603_32.1 S5 M5SB4	103	F603_32.1 P160 BN160L4	104
49	2737	1.8	30.0	27500	F703_30.0 S5 M5SB4	103	F703_30.0 P160 BN160L4	108
49	2702	1.1	29.6	20000	F603_29.6 S5 M5SB4	103	F603_29.6 P160 BN160L4	104
53	2527	1.8	27.7	27100	F703_27.7 S5 M5SB4	103	F703_27.7 P160 BN160L4	108
58	2302	2.7	25.2	32900	F803_25.2 S5 M5SB4	111	F803_25.2 P160 BN160L4	112
59	2241	1.8	24.6	26500	F703_24.6 S5 M5SB4	103	F703_24.6 P160 BN160L4	108
65	2063	2.1	22.6	26200	F703_22.6 S5 M5SB4	103	F703_22.6 P160 BN160L4	108
66	2010	3.4	22.0	31900	F803_22.0 S5 M5SB4	111	F803_22.0 P160 BN160L4	112
70	1904	2.1	20.9	25700	F703_20.9 S5 M5SB4	103	F703_20.9 P160 BN160L4	108
71	1885	1.0	20.7	20000	F603_20.7 S5 M5SB4	103	F603_20.7 P160 BN160L4	104
72	1855	3.4	20.3	31300	F803_20.3 S5 M5SB4	111	F803_20.3 P160 BN160L4	112
77	1740	1.1	19.1	20000	F603_19.1 S5 M5SB4	103	F603_19.1 P160 BN160L4	104
82	1616	2.7	17.7	24900	F703_17.7 S5 M5SB4	103	F703_17.7 P160 BN160L4	108
89	1491	2.7	16.3	24400	F703_16.3 S5 M5SB4	103	F703_16.3 P160 BN160L4	108
93	1431	1.3	15.7	19600	F603_15.7 S5 M5SB4	103	F603_15.7 P160 BN160L4	104
101	1321	1.4	14.5	19200	F603_14.5 S5 M5SB4	103	F603_14.5 P160 BN160L4	104
105	1267	3.1	13.9	23600	F703_13.9 S5 M5SB4	103	F703_13.9 P160 BN160L4	108
114	1170	3.1	12.8	23100	F703_12.8 S5 M5SB4	103	F703_12.8 P160 BN160L4	108
115	1162	1.6	12.7	18800	F603_12.7 S5 M5SB4	103	F603_12.7 P160 BN160L4	104
124	1072	1.8	11.8	18400	F603_11.8 S5 M5SB4	103	F603_11.8 P160 BN160L4	104
135	990	3.5	10.9	22300	F703_10.9 S5 M5SB4	103	F703_10.9 P160 BN160L4	108
146	914	3.5	10.0	21800	F703_10.0 S5 M5SB4	103	F703_10.0 P160 BN160L4	108
150	886	2.1	9.7	17700	F603_9.7 S5 M5SB4	103	F603_9.7 P160 BN160L4	104
161	844	1.2	9.1	6070			F502_9.1 P160 BN160L4	100
163	818	2.3	9.0	17300	F603_9.0 S5 M5SB4	103	F603_9.0 P160 BN160L4	104
203	671	1.4	7.2	5920			F502_7.2 P160 BN160L4	100

18.5 kW

10.6	15456	0.9	137.3	55000	F903_137.3 S5 M5LA4	115	F903_137.3 P180 BN180M4	116
11.5	14267	1.0	126.8	55000	F903_126.8 S5 M5LA4	115	F903_126.8 P180 BN180M4	116
13.0	12598	1.1	111.9	55000	F903_111.9 S5 M5LA4	115	F903_111.9 P180 BN180M4	116
14.1	11629	1.2	103.3	55000	F903_103.3 S5 M5LA4	115	F903_103.3 P180 BN180M4	116
15.2	10777	1.3	95.8	55000	F903_95.8 S5 M5LA4	115	F903_95.8 P180 BN180M4	116
16.5	9948	1.4	88.4	55000	F903_88.4 S5 M5LA4	115	F903_88.4 P180 BN180M4	116
19.0	8626	1.6	76.7	55000	F903_76.7 S5 M5LA4	115	F903_76.7 P180 BN180M4	116
19.1	8581	0.9	76.3	38100	F803_76.3 S5 M5LA4	111	F803_76.3 P180 BN180M4	112
20.6	7963	1.8	70.8	55000	F903_70.8 S5 M5LA4	115	F903_70.8 P180 BN180M4	116
20.7	7921	1.0	70.4	37600	F803_70.4 S5 M5LA4	111	F803_70.4 P180 BN180M4	112
23.5	6989	2.0	62.1	55000	F903_62.1 S5 M5LA4	115	F903_62.1 P180 BN180M4	116
23.8	6916	1.1	61.5	37400	F803_61.5 S5 M5LA4	111	F803_61.5 P180 BN180M4	112
25.5	6451	2.2	57.3	55000	F903_57.3 S5 M5LA4	115	F903_57.3 P180 BN180M4	116
25.7	6384	1.3	56.7	36800	F803_56.7 S5 M5LA4	111	F803_56.7 P180 BN180M4	112
29.3	5615	2.5	49.9	55000	F903_49.9 S5 M5LA4	115	F903_49.9 P180 BN180M4	116
29.7	5526	1.4	49.1	35800	F803_49.1 S5 M5LA4	111	F803_49.1 P180 BN180M4	112
29.8	5510	0.9	49.0	27400	F703_49.0 S5 M5LA4	103	F703_49.0 P180 BN180M4	108
32	5183	2.7	46.1	55000	F903_46.1 S5 M5LA4	115	F903_46.1 P180 BN180M4	116
32	5101	1.6	45.3	35700	F803_45.3 S5 M5LA4	111	F803_45.3 P180 BN180M4	112
32	5086	1.0	45.2	27200	F703_45.2 S5 M5LA4	103	F703_45.2 P180 BN180M4	108
36	4558	3.1	40.5	53700			F903_40.5 P180 BN180M4	116
37	4389	1.8	39.0	35000	F803_39.0 S5 M5LA4	111	F803_39.0 P180 BN180M4	112
38	4321	1.2	38.4	27000	F703_38.4 S5 M5LA4	103	F703_38.4 P180 BN180M4	108
39	4207	3.2	37.4	52700			F903_37.4 P180 BN180M4	116
41	4051	2.0	36.0	34400	F803_36.0 S5 M5LA4	111	F803_36.0 P180 BN180M4	112
41	3988	1.3	35.4	26700	F703_35.4 S5 M5LA4	103	F703_35.4 P180 BN180M4	108

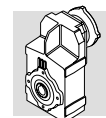


18.5 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
47	3517	2.3	31.3	33600	F703_30.0 S5 M5LA4	103	F803_31.3 P180 BN180M4	112
49	3376	1.5	30.0	26300			F703_30.0 P180 BN180M4	108
51	3246	2.5	28.8	33000			F803_28.8 P180 BN180M4	112
53	3116	1.5	27.7	26000	F703_27.7 S5 M5LA4	103	F703_27.7 P180 BN180M4	108
58	2839	2.2	25.2	32100	F803_25.2 S5 M5LA4	111	F803_25.2 P180 BN180M4	112
59	2764	1.4	24.6	25500	F703_24.6 S5 M5LA4	103	F703_24.6 P180 BN180M4	108
65	2544	1.7	22.6	25200	F703_22.6 S5 M5LA4	103	F703_22.6 P180 BN180M4	108
66	2479	2.7	22.0	31300	F803_22.0 S5 M5LA4	111	F803_22.0 P180 BN180M4	112
70	2348	1.7	20.9	24900	F703_20.9 S5 M5LA4	103	F703_20.9 P180 BN180M4	108
72	2288	2.7	20.3	30600	F803_20.3 S5 M5LA4	111	F803_20.3 P180 BN180M4	112
82	1993	2.2	17.7	24200	F703_17.7 S5 M5LA4	103	F703_17.7 P180 BN180M4	108
83	1981	3.4	17.6	29700	F803_17.6 S5 M5LA4	111	F803_17.6 P180 BN180M4	112
89	1839	2.2	16.3	23800	F703_16.3 S5 M5LA4	103	F703_16.3 P180 BN180M4	108
90	1828	3.4	16.2	29100	F803_16.2 S5 M5LA4	111	F803_16.2 P180 BN180M4	112
93	1765	1.1	15.7	18700	F603_15.7 S5 M5LA4	103	F603_15.7 P180 BN180M4	104
101	1629	1.2	14.5	18600	F603_14.5 S5 M5LA4	103	F603_14.5 P180 BN180M4	104
105	1563	2.5	13.9	23000	F703_13.9 S5 M5LA4	103	F703_13.9 P180 BN180M4	108
114	1442	2.5	12.8	22600	F703_12.8 S5 M5LA4	103	F703_12.8 P180 BN180M4	108
115	1433	1.3	12.7	18300	F603_12.7 S5 M5LA4	103	F603_12.7 P180 BN180M4	104
124	1323	1.4	11.8	17900	F603_11.8 S5 M5LA4	103	F603_11.8 P180 BN180M4	104
135	1221	2.8	10.9	21800	F703_10.9 S5 M5LA4	103	F703_10.9 P180 BN180M4	108
146	1127	2.8	10.0	21400	F703_10.0 S5 M5LA4	103	F703_10.0 P180 BN180M4	108
150	1092	1.7	9.7	17300	F603_9.7 S5 M5LA4	103	F603_9.7 P180 BN180M4	104
163	1008	1.9	9.0	16900	F603_9.0 S5 M5LA4	103	F603_9.0 P180 BN180M4	104
203	827	1.2	7.2	5500			F502_7.2 P180 BN180M4	100

22 kW

13.1	14880	0.9	111.9	55000			F903_111.9 P180 BN180L4	116
14.2	13735	1.0	103.3	55000			F903_103.3 P180 BN180L4	116
15.4	12728	1.1	95.8	55000			F903_95.8 P180 BN180L4	116
16.6	11749	1.2	88.4	55000			F903_88.4 P180 BN180L4	116
19.2	10188	1.4	76.7	55000			F903_76.7 P180 BN180L4	116
20.8	9405	1.5	70.8	55000			F903_70.8 P180 BN180L4	116
23.7	8254	1.7	62.1	55000			F903_62.1 P180 BN180L4	116
23.9	8169	1.0	61.5	35400			F803_61.5 P180 BN180L4	112
25.6	7619	1.8	57.3	55000			F903_57.3 P180 BN180L4	116
25.9	7541	1.1	56.7	35000			F803_56.7 P180 BN180L4	112
29.5	6632	2.1	49.9	54400			F903_49.9 P180 BN180L4	116
29.9	6527	1.2	49.1	34100			F803_49.1 P180 BN180L4	112
32	6122	2.3	46.1	53500			F903_46.1 P180 BN180L4	116
32	6025	1.3	45.3	34300			F803_45.3 P180 BN180L4	112
36	5383	2.6	40.5	52300			F903_40.5 P180 BN180L4	116
38	5184	1.5	39.0	33300			F803_39.0 P180 BN180L4	112
38	5103	1.0	38.4	25400			F703_38.4 P180 BN180L4	108
39	4969	2.7	37.4	51400			F903_37.4 P180 BN180L4	116
41	4785	1.7	36.0	33200			F803_36.0 P180 BN180L4	112
41	4711	1.1	35.4	25300			F703_35.4 P180 BN180L4	108
47	4154	1.9	31.3	32600			F803_31.3 P180 BN180L4	112
47	4120	3.2	31.0	49500			F903_31.0 P180 BN180L4	116
49	3988	1.3	30.0	25100			F703_30.0 P180 BN180L4	108
51	3834	2.1	28.8	32000			F803_28.8 P180 BN180L4	112
51	3803	3.2	28.6	48600			F903_28.6 P180 BN180L4	116
53	3681	1.3	27.7	24800			F703_27.7 P180 BN180L4	108
58	3353	1.9	25.2	31300			F803_25.2 P180 BN180L4	112
60	3264	1.2	24.6	24500			F703_24.6 P180 BN180L4	108
65	3005	1.4	22.6	24300			F703_22.6 P180 BN180L4	108
67	2928	2.3	22.0	30200			F803_22.0 P180 BN180L4	112
70	2773	1.4	20.9	24000			F703_20.9 P180 BN180L4	108
72	2703	2.3	20.3	29900			F803_20.3 P180 BN180L4	112
83	2354	1.8	17.7	23400			F703_17.7 P180 BN180L4	108
84	2339	2.9	17.6	29100			F803_17.6 P180 BN180L4	112
90	2173	1.8	16.3	23100			F703_16.3 P180 BN180L4	108
90	2159	2.9	16.2	28500			F803_16.2 P180 BN180L4	112
106	1846	2.1	13.9	22400			F703_13.9 P180 BN180L4	108



22 kW

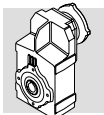
n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
115	1704	2.1	12.8	22100			F703_12.8 P180 BN180L4	108
115	1692	1.1	12.7	17700			F603_12.7 P180 BN180L4	104
125	1562	1.2	11.8	17400			F603_11.8 P180 BN180L4	104
135	1442	2.4	10.9	21400			F703_10.9 P180 BN180L4	108
147	1331	2.4	10.0	21000			F703_10.0 P180 BN180L4	108
151	1290	1.5	9.7	16900			F603_9.7 P180 BN180L4	104
164	1191	1.6	9.0	16500			F603_9.0 P180 BN180L4	104
204	977	1.0	7.2	5070			F502_7.2 P180 BN180L4	100

30 kW

16.6	16022	0.9	88.4	52200			F903_88.4 P200 BN200L4	116
19.2	13893	1.0	76.7	52400			F903_76.7 P200 BN200L4	116
20.8	12825	1.1	70.8	52100			F903_70.8 P200 BN200L4	116
23.7	11256	1.2	62.1	51800			F903_62.1 P200 BN200L4	116
25.6	10390	1.3	57.3	51400			F903_57.3 P200 BN200L4	116
29.5	9044	1.5	49.9	50800			F903_49.9 P200 BN200L4	116
32	8348	1.7	46.1	50200			F903_46.1 P200 BN200L4	116
32	8216	1.0	45.3	30900			F803_45.3 P200 BN200L4	112
36	7341	1.9	40.5	49400			F903_40.5 P200 BN200L4	116
38	7069	1.1	39.0	31000			F803_39.0 P200 BN200L4	112
39	6776	2.0	37.4	48700			F903_37.4 P200 BN200L4	116
41	6525	1.2	36.0	30600			F803_36.0 P200 BN200L4	112
47	5664	1.4	31.3	29900			F803_31.3 P200 BN200L4	112
47	5618	2.3	31.0	47300			F903_31.0 P200 BN200L4	116
49	5438	0.9	30.0	22300			F703_30.0 P200 BN200L4	108
51	5229	1.5	28.8	29500			F803_28.8 P200 BN200L4	112
51	5186	2.3	28.6	46600			F903_28.6 P200 BN200L4	116
53	5019	0.9	27.7	22200			F703_27.7 P200 BN200L4	108
58	4601	2.6	25.4	45500			F903_25.4 P200 BN200L4	116
58	4572	1.2	25.2	29500			F803_25.2 P200 BN200L4	112
66	4039	3.0	22.3	44400			F903_22.3 P200 BN200L4	116
67	3992	1.7	22.0	29000			F803_22.0 P200 BN200L4	112
71	3728	3.0	20.6	43600			F903_20.6 P200 BN200L4	116
72	3685	1.7	20.3	28500			F803_20.3 P200 BN200L4	112
83	3209	1.4	17.7	21800			F703_17.7 P200 BN200L4	108
84	3190	2.1	17.6	27900			F803_17.6 P200 BN200L4	112
90	2963	1.4	16.3	21500			F703_16.3 P200 BN200L4	108
90	2945	2.1	16.2	27400			F803_16.2 P200 BN200L4	112
105	2534	2.7	14.0	26700			F803_14.0 P200 BN200L4	112
106	2517	1.5	13.9	21100			F703_13.9 P200 BN200L4	108
114	2339	2.7	12.9	26200			F803_12.9 P200 BN200L4	112
115	2323	1.5	12.8	20900			F703_12.8 P200 BN200L4	108
135	1967	1.8	10.9	20300			F703_10.9 P200 BN200L4	108
142	1874	3.0	10.3	24900			F803_10.3 P200 BN200L4	112
147	1815	1.8	10.0	20000			F703_10.0 P200 BN200L4	108

37 kW

20.9	15710	0.9	70.8	47600			F903_70.8 P225 BN225S4	116
25.8	12728	1.1	57.3	47700			F903_57.3 P225 BN225S4	116
29.7	11079	1.3	49.9	47600			F903_49.9 P225 BN225S4	116
32	10227	1.4	46.1	47200			F903_46.1 P225 BN225S4	116
37	8993	1.6	40.5	46800			F903_40.5 P225 BN225S4	116
38	8659	0.9	39.0	28500			F803_39.0 P225 BN225S4	112
40	8301	1.6	37.4	46300			F903_37.4 P225 BN225S4	116
41	7993	1.0	36.0	28300			F803_36.0 P225 BN225S4	112
47	6939	1.2	31.3	28400			F803_31.3 P225 BN225S4	112
48	6882	1.9	31.0	45300			F903_31.0 P225 BN225S4	116
51	6405	1.2	28.8	28100			F803_28.8 P225 BN225S4	112
52	6353	1.9	28.6	44700			F903_28.6 P225 BN225S4	116
58	5637	2.1	25.4	43900			F903_25.4 P225 BN225S4	116
59	5601	1.1	25.2	27800			F803_25.2 P225 BN225S4	112
66	4947	2.4	22.3	43000			F903_22.3 P225 BN225S4	116
67	4891	1.1	22.0	27600			F803_22.0 P225 BN225S4	112



37 kW

n_2 min ⁻¹	M_2 Nm	S	i	R_{n2} N				
72	4567	2.5	20.6	42300			F903_20.6 P225 BN225S4	116
73	4515	1.1	20.3	27200			F803_20.3 P225 BN225S4	112
83	3975	2.8	17.9	41200			F903_17.9 P225 BN225S4	116
84	3908	1.7	17.6	26800			F803_17.6 P225 BN225S4	112
90	3669	2.8	16.5	40500			F903_16.5 P225 BN225S4	116
91	3607	1.7	16.2	26300			F803_16.2 P225 BN225S4	112
102	3226	3.1	14.5	39500			F903_14.5 P225 BN225S4	116
106	3104	2.2	14.0	25800			F803_14.0 P225 BN225S4	112
110	2978	3.1	13.4	38700			F903_13.4 P225 BN225S4	116
115	2865	2.2	12.9	25300			F803_12.9 P225 BN225S4	112
132	2487	2.4	11.2	24500			F803_11.2 P225 BN225S4	112
143	2296	2.4	10.3	24300			F803_10.3 P225 BN225S4	112

45 kW

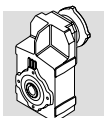
32	12438	1.1	46.1	43900			F903_46.1 P225 BN225M4	116
37	10937	1.3	40.5	43900			F903_40.5 P225 BN225M4	116
40	10096	1.3	37.4	43600			F903_37.4 P225 BN225M4	116
47	8439	0.9	31.3	26100			F803_31.3 P225 BN225M4	112
48	8370	1.6	31.0	43100			F903_31.0 P225 BN225M4	116
51	7790	1.0	28.8	26000			F803_28.8 P225 BN225M4	112
52	7726	1.6	28.6	42600			F903_28.6 P225 BN225M4	116
58	6855	1.8	25.4	42000			F903_25.4 P225 BN225M4	116
66	6017	2.0	22.3	41400			F903_22.3 P225 BN225M4	116
67	5948	1.1	22.0	26000			F803_22.0 P225 BN225M4	112
72	5554	2.0	20.6	40800			F903_20.6 P225 BN225M4	116
73	5491	1.1	20.3	25700			F803_20.3 P225 BN225M4	112
83	4834	2.3	17.9	39900			F903_17.9 P225 BN225M4	116
84	4753	1.4	17.6	25500			F803_17.6 P225 BN225M4	112
90	4463	2.3	16.5	39300			F903_16.5 P225 BN225M4	116
91	4387	1.4	16.2	25200			F803_16.2 P225 BN225M4	112
102	3924	2.5	14.5	38400			F903_14.5 P225 BN225M4	116
106	3775	1.8	14.0	24800			F803_14.0 P225 BN225M4	112
110	3622	2.6	13.4	37800			F903_13.4 P225 BN225M4	116
115	3484	1.8	12.9	24100			F803_12.9 P225 BN225M4	112
132	3025	1.5	11.2	24000			F803_11.2 P225 BN225M4	112
133	3003	2.9	11.1	36400			F903_11.1 P225 BN225M4	116
143	2792	2.0	10.3	23500			F803_10.3 P225 BN225M4	112

55 kW

32	15202	0.9	46.1	39700			F903_46.1 P250 BN250M4	116
37	13367	1.0	40.5	40300			F903_40.5 P250 BN250M4	116
40	12339	1.1	37.4	40200			F903_37.4 P250 BN250M4	116
48	10230	1.3	31.0	40300			F903_31.0 P250 BN250M4	116
52	9443	1.3	28.6	40100			F903_28.6 P250 BN250M4	116
58	8379	1.4	25.4	39700			F903_25.4 P250 BN250M4	116
66	7354	1.6	22.3	39400			F903_22.3 P250 BN250M4	116
72	6788	1.7	20.6	38900			F903_20.6 P250 BN250M4	116
83	5909	1.9	17.9	38300			F903_17.9 P250 BN250M4	116
90	5454	1.9	16.5	37800			F903_16.5 P250 BN250M4	116
102	4796	2.1	14.5	37100			F903_14.5 P250 BN250M4	116
110	4427	2.1	13.4	36600			F903_13.4 P250 BN250M4	116
133	3671	2.4	11.1	35400			F903_11.1 P250 BN250M4	116
144	3388	2.4	10.3	34800			F903_10.3 P250 BN250M4	116

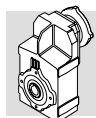


	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
F 10 2_7.4		378	63	2.6	1000	1290	189	76	1.6	1290	1640	85
F 10 2_9.8		286	73	2.3	980	1410	143	89	1.4	1250	1780	
F 10 2_13.0		215	85	2.0	940	1530	108	104	1.2	1210	1940	
F 10 2_14.6		192	94	2.0	1120	1590	96	119	1.3	1300	2000	
F 10 2_19.3		145	108	1.7	1100	1730	73	136	1.1	1300	2180	
F 10 2_25.8		109	123	1.5	1090	1890	54	140	0.84	1300	2430	
F 10 2_33.0		85	137	1.3	1070	2040	42	140	0.65	1300	2670	
F 10 2_39.6		71	140	1.1	1080	2190	35	140	0.54	1300	2800	
F 10 2_48.7		57	140	0.89	1090	2370	28.7	140	0.44	1300	2800	
F 10 2_63.0		44	140	0.69	1110	2620	22.2	140	0.34	1300	2800	
F 10 2_71.1		39	140	0.61	1000	2750	19.7	140	0.30	1300	2800	
F 10 2_91.5		31	140	0.47	1110	2800	15.3	140	0.24	1300	2800	
F 10 2_106.0		26.4	140	0.41	1120	2800	13.2	140	0.20	1300	2800	
F 10 2_127.1		22.0	140	0.34	1130	2800	11.0	140	0.17	1300	2800	
		n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
F 10 2_7.4		122	91	1.2	1300	1890	68	111	0.83	1300	2300	85
F 10 2_9.8		92	107	1.1	1300	2050	51	130	0.73	1300	2490	
F 10 2_13.0		69	124	0.95	1300	2240	38	140	0.59	1300	2760	
F 10 2_14.6		62	138	0.94	1300	2320	34	140	0.53	1300	2800	
F 10 2_19.3		47	140	0.72	1300	2580	26	140	0.40	1300	2800	
F 10 2_25.8		35	140	0.54	1300	2800	19	140	0.30	1300	2800	
F 10 2_33.0		27	140	0.42	1300	2800	15	140	0.23	1300	2800	
F 10 2_39.6		23	140	0.35	1300	2800	13	140	0.19	1300	2800	
F 10 2_48.7		18	140	0.28	1300	2800	10	140	0.16	1300	2800	
F 10 2_63.0		14	140	0.22	1300	2800	8	140	0.12	1300	2800	
F 10 2_71.1		13	140	0.20	1300	2800	7	140	0.11	1300	2800	
F 10 2_91.5		10	140	0.15	1300	2800	5	140	0.08	1300	2800	
F 10 2_106.0		8	140	0.13	1300	2800	5	140	0.07	1300	2800	
F 10 2_127.1		7	140	0.11	1300	2800	4	140	0.06	1300	2800	

**F 20****250 Nm**

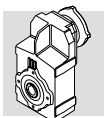
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		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
F 20 2_6.4		438	103	5.0	—	1370	219	130	3.1	—	1720	89
F 20 2_8.7		322	123	4.4	—	1490	161	155	2.7	—	1870	
F 20 2_11.2		250	141	3.9	—	1590	125	177	2.4	—	2010	
F 20 2_14.8		189	166	3.5	760	1740	95	203	2.1	1010	2210	
F 20 2_20.2		139	182	2.8	810	1940	69	223	1.7	1070	2460	
F 20 2_25.9		108	196	2.3	830	2110	54	240	1.4	1100	2680	
F 20 2_33.1		85	210	2.0	800	2300	42	250	1.2	1120	2940	
F 20 2_41.8		67	225	1.7	780	2490	33	250	0.92	1220	3240	
F 20 2_50.7		55	238	1.4	780	2660	27.6	250	0.76	1320	3500	
F 20 2_61.9		45	250	1.2	750	2860	22.6	250	0.62	1370	3790	
F 20 2_76.8		36	250	1.0	780	3130	18.2	250	0.50	1380	4000	
F 20 2_90.4		31	250	0.85	830	3340	15.5	250	0.43	1390	4000	
F 20 2_114.3		24	250	0.67	850	3670	12.2	250	0.34	1400	4000	
F 20 2_132.2		21	250	0.58	870	3890	10.6	250	0.29	1400	4000	
F 20 3_172.6		16	250	0.46	1130	4000	8.1	250	0.23	1300	4000	
F 20 3_209.3		13	250	0.38	1190	4000	6.7	250	0.19	1300	4000	
F 20 3_255.3		11	250	0.31	1240	4000	5.5	250	0.15	1300	4000	
F 20 3_316.9		9	250	0.25	1280	4000	4.4	250	0.12	1300	4000	
F 20 3_372.9		8	250	0.21	1300	4000	3.8	250	0.11	1300	4000	
F 20 3_471.7		6	250	0.17	1300	4000	3.0	250	0.08	1300	4000	
F 20 3_545.3		5	250	0.15	1300	4000	2.6	250	0.07	1300	4000	
$n_1 = 900 \text{ min}^{-1}$						$n_1 = 500 \text{ min}^{-1}$						89
F 20 2_6.4		141	150	2.3	—	1990	78	183	1.6	—	2420	
F 20 2_8.7		103	180	2.1	—	2170	57	219	1.4	—	2640	
F 20 2_11.2		80	205	1.8	—	2330	45	250	1.2	—	2830	
F 20 2_14.8		61	232	1.6	1210	2570	34	250	0.93	1790	3230	
F 20 2_20.2		45	250	1.2	1320	2870	25	250	0.68	1960	3650	
F 20 2_25.9		35	250	0.96	1500	3190	19.3	250	0.53	2010	4000	
F 20 2_33.1		27.2	250	0.75	1580	3520	15.1	250	0.42	2040	4000	
F 20 2_41.8		21.5	250	0.59	1610	3870	12.0	250	0.33	2070	4000	
F 20 2_50.7		17.8	250	0.49	1640	4000	9.9	250	0.27	2090	4000	
F 20 2_61.9		14.5	250	0.40	1660	4000	8.1	250	0.22	2110	4000	
F 20 2_76.8		11.7	250	0.32	1670	4000	6.5	250	0.18	2120	4000	
F 20 2_90.4		10.0	250	0.27	1680	4000	5.5	250	0.15	2130	4000	
F 20 2_114.3		7.9	250	0.22	1690	4000	4.4	250	0.12	2140	4000	
F 20 2_132.2		6.8	250	0.19	1690	4000	3.8	250	0.10	2150	4000	
F 20 3_172.6		5.2	250	0.15	1300	4000	2.9	250	0.08	1300	4000	
F 20 3_209.3		4.3	250	0.12	1300	4000	2.4	250	0.07	1300	4000	
F 20 3_255.3		3.5	250	0.10	1300	4000	2.0	250	0.06	1300	4000	
F 20 3_316.9		2.8	250	0.08	1300	4000	1.6	250	0.04	1300	4000	
F 20 3_372.9		2.4	250	0.07	1300	4000	1.3	250	0.04	1300	4000	
F 20 3_471.7		1.9	250	0.05	1300	4000	1.1	250	0.03	1300	4000	
F 20 3_545.3		1.7	250	0.05	1300	4000	0.9	250	0.03	1300	4000	

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)
 (-) Contact our technical service department advising radial load data (rotation direction, orientation, position)
 (-) Nehmen Sie bitte Kontakt mit unserem Applikationsdienst und Querkraftsdaten angeben (Drehrichtung, Orientierung, Anordnung)
 (-) Consulter notre service technique en donnant les détails concernant la charge radiale (sens de rotation, indexage, position)



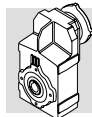
	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
F 30 2_6.9		406	220	9.8	—	3010	203	280	6.3	—	3790	93
F 30 2_9.0		311	250	8.6	—	3250	156	315	5.4	—	4090	
F 30 2_12.0		233	270	6.9	—	3590	117	345	4.4	—	4500	
F 30 2_15.1		185	290	5.9	—	3890	93	370	3.8	—	4880	
F 30 2_19.5		144	310	4.9	—	4250	72	380	3.0	210	5400	
F 30 2_24.4		115	330	4.2	—	4600	57	380	2.4	440	5930	
F 30 2_28.9		97	340	3.6	—	4900	48	380	2.0	580	6370	
F 30 2_35.0		80	350	3.1	—	5280	40	360	1.6	960	6500	
F 30 3_40.2		70	380	3.0	1860	5470	35	470	1.8	2200	6500	
F 30 3_52.1		54	420	2.5	1860	5940	26.9	510	1.5	2200	6500	
F 30 3_69.1		41	460	2.1	1870	6500	20.3	550	1.3	2200	6500	
F 30 3_87.4		32	490	1.8	1880	6500	16.0	550	1.0	2200	6500	
F 30 3_112.5		24.9	530	1.5	1870	6500	12.4	550	0.77	2200	6500	
F 30 3_140.7		19.9	550	1.2	1870	6500	10.0	550	0.62	2200	6500	
F 30 3_166.8		16.8	550	1.0	1880	6500	8.4	550	0.52	2200	6500	
F 30 3_202.3		13.8	550	0.86	1890	6500	6.9	550	0.43	2200	6500	
F 30 3_253.6		11.0	550	0.69	1900	6500	5.5	550	0.34	2200	6500	
F 30 3_293.8		9.5	550	0.59	1900	6500	4.8	550	0.30	2200	6500	
F 30 3_374.4		7.5	550	0.46	1910	6500	3.7	550	0.23	2200	6500	
F 30 4_462.6		6.1	550	0.39	1300	6500	3.0	55	0.02	1300	6500	
F 30 4_578.6		4.8	550	0.31	1300	6500	2.4	550	0.15	1300	6500	
F 30 4_685.6		4.1	550	0.26	1300	6500	2.0	550	0.13	1300	6500	
F 30 4_831.6		3.4	550	0.21	1300	6500	1.7	550	0.11	1300	6500	
F 30 4_1042		2.7	550	0.17	1300	6500	1.3	550	0.09	1300	6500	
F 30 4_1208		2.3	550	0.15	1300	6500	1.2	550	0.07	1300	6500	
F 30 4_1539		1.8	550	0.12	1300	6500	0.9	550	0.06	1300	6500	
n ₁ = 900 min ⁻¹						n ₁ = 500 min ⁻¹						
F 30 2_6.9		130	325	4.7	—	4380	72	380	3.0	340	5400	93
F 30 2_9.0		100	365	4.0	—	4740	56	380	2.3	1080	6020	
F 30 2_12.0		75	380	3.1	330	5290	42	380	1.7	1690	6500	
F 30 2_15.1		60	380	2.5	720	5850	33	380	1.4	2080	6500	
F 30 2_19.5		46	380	1.9	1070	6500	25.6	380	1.1	2200	6500	
F 30 2_24.4		37	380	1.5	1300	6500	20.5	380	0.86	2200	6500	
F 30 2_28.9		31	380	1.3	1440	6500	17.3	380	0.72	2200	6500	
F 30 2_35.0		25.7	360	1.0	1820	6500	14.3	360	0.57	2200	6500	
F 30 3_40.2		22.4	540	1.4	2200	6500	12.4	550	0.77	2200	6500	
F 30 3_52.1		17.3	550	1.1	2200	6500	9.6	550	0.60	2200	6500	
F 30 3_69.1		13.0	550	0.81	2200	6500	7.2	550	0.45	2200	6500	
F 30 3_87.4		10.3	550	0.64	2200	6500	5.7	550	0.36	2200	6500	
F 30 3_112.5		8.0	550	0.50	2200	6500	4.4	550	0.28	2200	6500	
F 30 3_140.7		6.4	550	0.40	2200	6500	3.6	550	0.22	2200	6500	
F 30 3_166.8		5.4	550	0.34	2200	6500	3.0	550	0.19	2200	6500	
F 30 3_202.3		4.4	550	0.28	2200	6500	2.5	550	0.15	2200	6500	
F 30 3_253.6		3.5	550	0.22	2200	6500	2.0	550	0.12	2200	6500	
F 30 3_293.8		3.1	550	0.19	2200	6500	1.7	550	0.11	2200	6500	
F 30 3_374.4		2.4	550	0.15	2200	6500	1.3	550	0.08	2200	6500	
F 30 4_462.6		1.9	550	0.12	1300	6500	1.1	550	0.07	1300	6500	
F 30 4_578.6		1.6	550	0.10	1300	6500	0.86	550	0.06	1300	6500	
F 30 4_685.6		1.3	550	0.08	1300	6500	0.73	550	0.05	1300	6500	
F 30 4_831.6		1.1	550	0.07	1300	6500	0.60	550	0.04	1300	6500	
F 30 4_1042		0.9	550	0.06	1300	6500	0.48	550	0.03	1300	6500	
F 30 4_1208		0.7	550	0.05	1300	6500	0.41	550	0.03	1300	6500	
F 30 4_1539		0.6	550	0.04	1300	6500	0.32	550	0.02	1300	6500	

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)
 (-) Contact our technical service department advising radial load data (rotation direction, orientation, position)
 (-) Nehmen Sie bitte Kontakt mit unserem Applikationsdienst und Querkraftsdaten angeben (Drehrichtung, Orientierung, Anordnung)
 (-) Consulter notre service technique en donnant les détails concernant la charge radiale (sens de rotation, indexage, position)

**F 40****950 Nm**

	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
F 40 2_6.7		418	390	17.9	—	3580	209	490	11.3	—	4510	97
F 40 2_9.1		308	440	14.9	—	3930	154	550	9.3	—	4970	
F 40 2_11.8		237	490	12.8	—	4240	119	620	8.1	—	5330	
F 40 2_15.1		185	515	10.5	—	4660	93	650	6.6	—	5870	
F 40 2_18.8		149	540	8.9	—	5070	74	680	5.6	—	6390	
F 40 2_23.8		118	570	7.4	—	5540	59	700	4.5	190	7050	
F 40 2_29.9		94	600	6.2	—	6030	47	640	3.3	1160	8020	
F 40 2_35.3		79	580	5.1	330	6570	40	580	2.5	1920	8500	
F 40 3_37.9		74	610	5.1	2840	6670	37	750	3.1	3500	8500	
F 40 3_51.5		54	700	4.3	2830	7290	27.2	860	2.6	3500	8500	
F 40 3_66.5		42	790	3.8	2830	7840	21.1	950	2.3	3500	8500	
F 40 3_84.9		33	850	3.2	2820	8500	16.5	950	1.8	3500	8500	
F 40 3_106.0		26.4	910	2.7	2820	8500	13.2	950	1.4	3500	8500	
F 40 3_134.4		20.8	95	0.2	2820	8500	10.4	950	1.1	3500	8500	
F 40 3_168.7		16.6	950	1.8	2840	8500	8.3	950	0.89	3500	8500	
F 40 3_198.9		14.1	950	1.5	2850	8500	7.0	950	0.76	3500	8500	
F 40 3_240.1		11.7	950	1.3	2860	8500	5.8	950	0.63	3500	8500	
F 40 3_296.6		9.4	950	1.0	2870	8500	4.7	950	0.51	3500	8500	
F 40 3_344.8		8.1	950	0.87	2880	8500	4.1	950	0.44	3500	8500	
F 40 4_433.7		6.5	950	0.71	1300	8500	3.2	950	0.36	1300	8500	
F 40 4_549.8		5.1	950	0.56	1300	8500	2.5	950	0.28	1300	8500	
F 40 4_690.1		4.1	950	0.45	1300	8500	2.0	950	0.22	1300	8500	
F 40 4_813.8		3.4	950	0.38	1300	8500	1.7	950	0.19	1300	8500	
F 40 4_982.4		2.9	950	0.31	1300	8500	1.4	950	0.16	1300	8500	
F 40 4_1213		2.3	950	0.25	1300	8500	1.2	950	0.13	1300	8500	
F 40 4_1411		2.0	950	0.22	1300	8500	1.0	950	0.11	1300	8500	
n ₁ = 900 min ⁻¹						n ₁ = 500 min ⁻¹						
F 40 2_6.7		134	570	8.4	—	5220	75	600	4.9	1510	6690	97
F 40 2_9.1		99	640	7.0	—	5750	55	700	4.2	1100	7280	
F 40 2_11.8		76	700	5.9	130	6250	42	700	3.3	2060	8150	
F 40 2_15.1		60	700	4.6	610	6990	33	700	2.6	2540	8500	
F 40 2_18.8		48	700	3.7	1050	7730	26.6	700	2.0	2980	8500	
F 40 2_23.8		38	700	2.9	1420	8500	21.0	700	1.6	3350	8500	
F 40 2_29.9		30	640	2.1	2390	8500	16.7	640	1.2	3500	8500	
F 40 2_35.3		25.5	580	1.6	3140	8500	14.2	580	0.9	3500	8500	
F 40 3_37.9		23.7	860	2.3	3500	8500	13.2	950	1.4	3500	8500	
F 40 3_51.5		17.5	950	1.9	3500	8500	9.7	950	1.0	3500	8500	
F 40 3_66.5		13.5	950	1.5	3500	8500	7.5	950	0.81	3500	8500	
F 40 3_84.9		10.6	950	1.1	3500	8500	5.9	950	0.63	3500	8500	
F 40 3_106.0		8.5	950	0.91	3500	8500	4.7	950	0.51	3500	8500	
F 40 3_134.4		6.7	950	0.72	3500	8500	3.7	950	0.40	3500	8500	
F 40 3_168.7		5.3	950	0.57	3500	8500	3.0	950	0.32	3500	8500	
F 40 3_198.9		4.5	950	0.49	3500	8500	2.5	950	0.27	3500	8500	
F 40 3_240.1		3.7	950	0.40	3500	8500	2.1	950	0.22	3500	8500	
F 40 3_296.6		3.0	950	0.33	3500	8500	1.7	950	0.18	3500	8500	
F 40 3_344.8		2.6	950	0.28	3500	8500	1.5	950	0.16	3500	8500	
F 40 4_433.7		2.1	950	0.23	1300	8500	1.2	950	0.13	1300	8500	
F 40 4_549.8		1.6	950	0.18	1300	8500	0.91	950	0.10	1300	8500	
F 40 4_690.1		1.3	950	0.14	1300	8500	0.72	950	0.08	1300	8500	
F 40 4_813.8		1.1	950	0.12	1300	8500	0.61	950	0.07	1300	8500	
F 40 4_982.4		0.92	950	0.10	1300	8500	0.51	950	0.06	1300	8500	
F 40 4_1213		0.74	950	0.08	1300	8500	0.41	950	0.05	1300	8500	
F 40 4_1411		0.64	950	0.07	1300	8500	0.35	950	0.04	1300	8500	

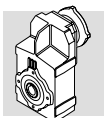
(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)
 (-) Contact our technical service department advising radial load data (rotation direction, orientation, position)
 (-) Nehmen Sie bitte Kontakt mit unserem Applikationsdienst und Querkraftsdaten angeben (Drehrichtung, Orientierung, Anordnung)
 (-) Consulter notre service technique en donnant les détails concernant la charge radiale (sens de rotation, indexage, position)



	i	$n_1 = 2800 \text{ min}^{-1}$					$n_1 = 1400 \text{ min}^{-1}$					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
F 50 2_7.2		389	445	19.1	—	5030	194	560	12.0	—	6340	101
F 50 2_9.1		308	490	16.6	—	5400	154	620	10.5	—	6800	
F 50 2_12.2		230	545	13.8	—	5950	115	690	8.7	—	7490	
F 50 2_15.4		182	590	11.8	—	6440	91	740	7.4	—	8120	
F 50 2_19.5		144	620	9.8	—	7000	72	780	6.2	—	8830	
F 50 2_24.0		117	645	8.3	—	7570	58	810	5.2	—	9550	
F 50 2_30.7		91	680	6.8	—	8270	46	850	4.3	—	10430	
F 50 3_38.9		72	980	8.0	2450	8280	36	1250	5.1	3110	10520	
F 50 3_48.9		57	1090	7.1	2450	8850	28.6	1350	4.4	3100	11210	
F 50 3_65.8		43	1210	5.8	2460	9750	21.3	1600	3.8	3110	12000	
F 50 3_83.2		34	1290	4.9	2480	10620	16.8	1600	3.0	3130	12000	
F 50 3_105.1		26.6	1390	4.2	2460	11460	13.3	1600	2.4	3160	12000	
F 50 3_129.9		21.6	1480	3.6	2450	12000	10.8	1600	1.9	3190	12000	
F 50 3_165.6		16.9	1590	3.0	2450	12000	8.5	1600	1.5	3220	12000	
F 50 3_202.4		13.8	1600	2.5	2460	12000	6.9	1600	1.3	3230	12000	
F 50 3_239.8		11.7	1600	2.1	2470	12000	5.8	1600	1.1	3250	12000	
F 50 3_285.9		9.8	1600	1.8	2480	12000	4.9	1600	0.89	3260	12000	
F 50 3_352.5		7.9	1600	1.4	2480	12000	4.0	1600	0.72	3260	12000	
F 50 4_429.1		6.5	1600	1.2	2200	12000	3.3	1600	0.61	2200	12000	
F 50 4_530.5		5.3	1600	1.0	2200	12000	2.6	1600	0.49	2200	12000	
F 50 4_676.3		4.1	1600	0.77	2200	12000	2.1	1600	0.38	2200	12000	
F 50 4_826.4		3.4	1600	0.63	2200	12000	1.7	1600	0.31	2200	12000	
F 50 4_979.4		2.9	1600	0.53	2200	12000	1.4	1600	0.27	2200	12000	
F 50 4_1168		2.4	1600	0.44	2200	12000	1.2	1600	0.22	2200	12000	
F 50 4_1439		1.9	1600	0.36	2200	12000	1.0	1600	0.18	2200	12000	

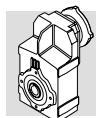
$n_1 = 900 \text{ min}^{-1}$						$n_1 = 500 \text{ min}^{-1}$						101
n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N		
F 50 2_7.2		125	650	8.9	—	7340	69	790	6.0	—	8930	
F 50 2_9.1		99	715	7.8	—	7890	55	870	5.3	—	9590	
F 50 2_12.2		74	795	6.5	—	8690	41	970	4.4	—	10570	
F 50 2_15.4		58	860	5.5	—	9400	32	1000	3.6	460	11560	
F 50 2_19.5		46	905	4.6	—	10230	25.6	1000	2.8	880	12000	
F 50 2_24.0		38	940	3.9	—	11060	20.8	1000	2.3	1280	12000	
F 50 2_30.7		29.3	900	2.9	790	12000	16.3	900	1.6	2580	12000	
F 50 3_38.9		23.1	1380	3.6	3500	12000	12.9	1600	2.3	3500	12000	
F 50 3_48.9		18.4	1530	3.2	3500	12000	10.2	1590	1.8	3500	12000	
F 50 3_65.8		13.7	1600	2.5	3500	12000	7.6	1600	1.4	3500	12000	
F 50 3_83.2		10.8	1600	2.0	3500	12000	6.0	1600	1.1	3500	12000	
F 50 3_105.1		8.6	1600	1.5	3500	12000	4.8	1600	0.86	3500	12000	
F 50 3_129.9		6.9	1600	1.3	3500	12000	3.8	1600	0.70	3500	12000	
F 50 3_165.6		5.4	1600	1.0	3500	12000	3.0	1600	0.55	3500	12000	
F 50 3_202.4		4.4	1600	0.80	3500	12000	2.5	1600	0.45	3500	12000	
F 50 3_239.8		3.8	1600	0.68	3500	12000	2.1	1600	0.38	3500	12000	
F 50 3_285.9		3.1	1600	0.57	3500	12000	1.7	1600	0.32	3500	12000	
F 50 3_352.5		2.6	1600	0.46	3500	12000	1.4	1600	0.26	3500	12000	
F 50 4_429.1		2.1	1600	0.39	2200	12000	1.2	1600	0.22	2200	12000	
F 50 4_530.5		1.7	1600	0.31	2200	12000	0.94	1600	0.17	2200	12000	
F 50 4_676.3		1.3	1600	0.25	2200	12000	0.74	1600	0.14	2200	12000	
F 50 4_826.4		1.1	1600	0.20	2200	12000	0.61	1600	0.11	2200	12000	
F 50 4_979.4		0.92	1600	0.17	2200	12000	0.51	1600	0.09	2200	12000	
F 50 4_1168		0.77	1600	0.14	2200	12000	0.43	1600	0.08	2200	12000	
F 50 4_1439		0.63	1600	0.12	2200	12000	0.35	1600	0.06	2200	12000	

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)
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**F 60****2900 Nm**

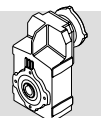
	i	$n_1 = 2800 \text{ min}^{-1}$					$n_1 = 1400 \text{ min}^{-1}$					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
F 60 3_9.0		311	920	32	—	13270	156	1160	20	—	16530	105
F 60 3_9.7		289	1000	33	—	13620	144	1250	20	—	16720	
F 60 3_11.8		237	1030	28	—	14550	119	1300	17.4	—	17840	
F 60 3_12.7		220	1110	28	—	14710	110	1400	17.4	—	18030	
F 60 3_14.5		193	1110	24	—	15450	97	1400	15.3	—	18950	
F 60 3_15.7		178	1200	24	—	15620	89	1500	15.1	—	19170	
F 60 3_19.1		147	1200	20	—	16800	73	1500	12.4	—	20000	
F 60 3_20.7		135	1300	20	—	16970	68	1640	12.5	—	20000	
F 60 3_23.5		119	1260	17	—	17920	60	1590	10.7	—	20000	
F 60 3_25.4		110	1370	17	—	18090	55	1720	10.7	—	20000	
F 60 3_29.6		95	2750	29	820	15920	47	2900	15.5	2630	20000	
F 60 3_32.1		87	2800	28	1290	16200	44	2900	14.3	3260	20000	
F 60 3_38.8		72	2900	24	1260	17480	36	2900	11.8	3480	20000	
F 60 3_42.1		67	2900	22	1820	17910	33	2900	10.9	3720	20000	
F 60 3_47.8		59	2900	19.2	1770	19050	29.3	2900	9.6	3730	20000	
F 60 3_51.8		54	2900	17.7	2290	19530	27.0	2900	8.9	3830	20000	
F 60 3_63.0		44	2900	14.6	2310	20000	22.2	2900	7.3	3850	20000	
F 60 3_68.3		41	2900	13.4	2790	20000	20.5	2900	6.7	3940	20000	
F 60 3_77.6		36	2900	11.8	2620	20000	18.0	2900	5.9	3920	20000	
F 60 3_84.0		33	2900	10.9	2960	20000	16.7	2900	5.5	4010	20000	
F 60 3_98.2		28.5	2900	9.3	2910	20000	14.3	2900	4.7	3980	20000	
F 60 3_106.4		26.3	2900	8.6	3020	20000	13.2	2900	4.3	4070	20000	
F 60 3_120.5		23.2	2900	7.6	2970	20000	11.6	2900	3.8	4030	20000	
F 60 3_130.5		21.5	2900	7.0	3060	20000	10.7	2900	3.5	4110	20000	
F 60 3_150.4		18.6	2900	6.1	3010	20000	9.3	2900	3.0	4060	20000	
F 60 3_162.9		17.2	2900	5.6	3090	20000	8.6	2900	2.8	4140	20000	
F 60 3_185.9		15.1	2900	4.9	3050	20000	7.5	2900	2.5	4100	20000	
F 60 3_201.4		13.9	2900	4.6	3130	20000	7.0	2900	2.3	4180	20000	
F 60 3_217.6		12.9	2900	4.2	3070	20000	6.4	2900	2.1	4120	20000	
F 60 3_235.8		11.9	2900	3.9	3140	20000	5.9	2900	1.9	4190	20000	
F 60 3_259.1		10.8	2900	3.5	3080	20000	5.4	2900	1.8	4130	20000	
F 60 3_280.7		10.0	2900	3.3	3150	20000	5.0	2900	1.6	4200	20000	
F 60 4_315.4		8.9	2900	3.0	3500	20000	4.4	2900	1.5	3500	20000	
F 60 4_341.7		8.2	2900	2.8	3500	20000	4.1	2900	1.4	3500	20000	
F 60 4_399.3		7.0	2900	2.4	3500	20000	3.5	2900	1.2	3500	20000	
F 60 4_432.6		6.5	2900	2.2	3500	20000	3.2	2900	1.1	3500	20000	
F 60 4_489.8		5.7	2900	1.9	3500	20000	2.9	2900	0.96	3500	20000	
F 60 4_530.7		5.3	2900	1.8	3500	20000	2.6	2900	0.89	3500	20000	
F 60 4_611.4		4.6	2900	1.5	3500	20000	2.3	2900	0.77	3500	20000	
F 60 4_662.4		4.2	2900	1.4	3500	20000	2.1	2900	0.71	3500	20000	
F 60 4_756.0		3.7	2900	1.2	3500	20000	1.9	2900	0.62	3500	20000	
F 60 4_819.0		3.4	2900	1.1	3500	20000	1.7	2900	0.57	3500	20000	
F 60 4_885.1		3.2	2900	1.1	3500	20000	1.6	2900	0.53	3500	20000	
F 60 4_958.9		2.9	2900	0.98	3500	20000	1.5	2900	0.49	3500	20000	
F 60 4_1054		2.7	2900	0.89	3500	20000	1.3	2900	0.45	3500	20000	
F 60 4_1141		2.5	2900	0.83	3500	20000	1.2	2900	0.41	3500	20000	

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)
 (-) Contact our technical service department advising radial load data (rotation direction, orientation, position)
 (-) Nehmen Sie bitte Kontakt mit unserem Applikationsdienst und Querkraftsdaten angeben (Drehrichtung, Orientierung, Anordnung)
 (-) Consulter notre service technique en donnant les détails concernant la charge radiale (sens de rotation, indexage, position)

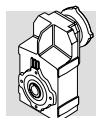


	i	$n_1 = 900 \text{ min}^{-1}$					$n_1 = 500 \text{ min}^{-1}$					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
F 60 3_9.0		100	1340	15.1	—	18840	56	1630	10.2	—	20000	105
F 60 3_9.7		93	1460	15.3	—	19010	52	1780	10.4	—	20000	
F 60 3_11.8		76	1500	12.9	—	20000	42	1830	8.8	—	20000	
F 60 3_12.7		71	1620	13.0	—	20000	39	1900	8.4	600	20000	
F 60 3_14.5		62	1620	11.4	—	20000	34	1900	7.4	490	20000	
F 60 3_15.7		57	1750	11.3	—	20000	32	1900	6.8	1630	20000	
F 60 3_19.1		47	1750	9.3	—	20000	26.2	1900	5.6	1660	20000	
F 60 3_20.7		43	1900	9.3	—	20000	24.2	1900	5.2	2700	20000	
F 60 3_23.5		38	1840	8.0	—	20000	21.3	1900	4.6	2340	20000	
F 60 3_25.4		35	1900	7.6	620	20000	19.7	1900	4.2	3330	20000	
F 60 3_29.6		30	2900	10.0	4220	20000	16.9	2900	5.5	4700	20000	
F 60 3_32.1		28.0	2900	9.2	4350	20000	15.6	2900	5.1	4700	20000	
F 60 3_38.8		23.2	2900	7.6	4420	20000	12.9	2900	4.2	4700	20000	
F 60 3_42.1		21.4	2900	7.0	4530	20000	11.9	2900	3.9	4700	20000	
F 60 3_47.8		18.8	2900	6.2	4530	20000	10.5	2900	3.4	4700	20000	
F 60 3_51.8		17.4	2900	5.7	4640	20000	9.7	2900	3.2	4700	20000	
F 60 3_63.0		14.3	2900	4.7	4660	20000	7.9	2900	2.6	4700	20000	
F 60 3_68.3		13.2	2900	4.3	4700	20000	7.3	2900	2.4	4700	20000	
F 60 3_77.6		11.6	2900	3.8	4700	20000	6.4	2900	2.1	4700	20000	
F 60 3_84.0		10.7	2900	3.5	4700	20000	6.0	2900	1.9	4700	20000	
F 60 3_98.2		9.2	2900	3.0	4700	20000	5.1	2900	1.7	4700	20000	
F 60 3_106.4		8.5	2900	2.8	4700	20000	4.7	2900	1.5	4700	20000	
F 60 3_120.5		7.5	2900	2.4	4700	20000	4.1	2900	1.4	4700	20000	
F 60 3_130.5		6.9	2900	2.3	4700	20000	3.8	2900	1.3	4700	20000	
F 60 3_150.4		6.0	2900	2.0	4700	20000	3.3	2900	1.1	4700	20000	
F 60 3_162.9		5.5	2900	1.8	4700	20000	3.1	2900	1.0	4700	20000	
F 60 3_185.9		4.8	2900	1.6	4700	20000	2.7	2900	0.88	4700	20000	
F 60 3_201.4		4.5	2900	1.5	4700	20000	2.5	2900	0.81	4700	20000	
F 60 3_217.6		4.1	2900	1.4	4700	20000	2.3	2900	0.75	4700	20000	
F 60 3_235.8		3.8	2900	1.3	4700	20000	2.1	2900	0.69	4700	20000	
F 60 3_259.1		3.5	2900	1.1	4700	20000	1.9	2900	0.63	4700	20000	
F 60 3_280.7		3.2	2900	1.1	4700	20000	1.8	2900	0.58	4700	20000	
F 60 4_315.4		2.9	2900	0.96	3500	20000	1.6	2900	0.53	3500	20000	
F 60 4_341.7		2.6	2900	0.89	3500	20000	1.5	2900	0.49	3500	20000	
F 60 4_399.3		2.3	2900	0.76	3500	20000	1.3	2900	0.42	3500	20000	
F 60 4_432.6		2.1	2900	0.70	3500	20000	1.2	2900	0.39	3500	20000	
F 60 4_489.8		1.8	2900	0.62	3500	20000	1.0	2900	0.34	3500	20000	
F 60 4_530.7		1.7	2900	0.57	3500	20000	0.94	2900	0.32	3500	20000	
F 60 4_611.4		1.5	2900	0.50	3500	20000	0.82	2900	0.28	3500	20000	
F 60 4_662.4		1.4	2900	0.46	3500	20000	0.75	2900	0.25	3500	20000	
F 60 4_756.0		1.2	2900	0.40	3500	20000	0.66	2900	0.22	3500	20000	
F 60 4_819.0		1.1	2900	0.37	3500	20000	0.61	2900	0.21	3500	20000	
F 60 4_885.1		1.0	2900	0.34	3500	20000	0.56	2900	0.19	3500	20000	
F 60 4_958.9		0.94	2900	0.32	3500	20000	0.52	2900	0.18	3500	20000	
F 60 4_1054		0.85	2900	0.29	3500	20000	0.47	2900	0.16	3500	20000	
F 60 4_1141		0.79	2900	0.27	3500	20000	0.44	2900	0.15	3500	20000	

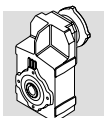
(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)
 (-) Contact our technical service department advising radial load data (rotation direction, orientation, position)
 (-) Nehmen Sie bitte Kontakt mit unserem Applikationsdienst und Querkraftsdaten angeben (Drehrichtung, Orientierung, Anordnung)
 (-) Consulter notre service technique en donnant les détails concernant la charge radiale (sens de rotation, indexage, position)

**F 70****5000 Nm**

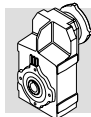
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		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
F 70 3_10.0		280	2600	82	1410	14770	140	3200	51	1750	18190	109
F 70 3_10.9		257	2800	81	1510	14710	128	3450	50	1840	18110	
F 70 3_12.8		219	2900	72	860	15710	109	3600	44	880	19280	
F 70 3_13.9		201	3150	72	810	15570	101	3900	44	880	19120	
F 70 3_16.3		172	3250	63	570	16630	86	4000	39	710	20480	
F 70 3_17.7		158	3550	63	430	16400	79	4350	39	630	20240	
F 70 3_20.9		134	3450	52	690	17990	67	4000	30	2090	22650	
F 70 3_22.6		124	3750	52	640	17800	62	4350	30	2010	22470	
F 70 3_24.6		114	3550	46	560	19040	57	4000	26	2510	24180	
F 70 3_27.7		101	3750	43	5070	19600	51	4650	27	6410	24060	
F 70 3_30.0		93	4050	43	5080	19440	47	5000	26	6420	23910	
F 70 3_35.4		79	4150	37	5070	20880	40	5000	22	6440	25930	
F 70 3_38.4		73	4500	37	5060	20650	36	5000	21	6540	26540	
F 70 3_45.2		62	4600	32	5080	22180	31	5000	17.5	6590	28650	
F 70 3_49.0		57	4600	30	5170	22710	28.6	5000	16.1	6680	29320	
F 70 3_57.7		49	5000	27	5090	23760	24.3	5000	13.7	6680	31570	
F 70 3_62.5		45	5000	25	5170	24330	22.4	5000	12.7	6760	32310	
F 70 3_67.9		41	5000	23	5110	25460	20.6	5000	11.6	6710	33640	
F 70 3_73.6		38	5000	21	5190	26070	19.0	5000	10.7	6790	34420	
F 70 3_85.4		33	5000	18.5	5190	27990	16.4	5000	9.3	6780	35000	
F 70 3_92.5		30	5000	17.1	5260	28650	15.1	5000	8.5	6860	35000	
F 70 3_101.2		27.7	5000	15.6	5220	29970	13.8	5000	7.8	6820	35000	
F 70 3_109.6		25.5	5000	14.4	5290	30670	12.8	5000	7.2	6890	35000	
F 70 3_122.7		22.8	5000	12.9	5250	32340	11.4	5000	6.4	6850	35000	
F 70 3_133.0		21.1	5000	11.9	5320	33100	10.5	5000	5.9	6920	35000	
F 70 3_153.8		18.2	5000	10.3	5280	35000	9.1	5000	5.1	6880	35000	
F 70 3_166.7		16.8	5000	9.5	5350	35000	8.4	5000	4.7	6950	35000	
F 70 3_180.9		15.5	5000	8.7	5310	35000	7.7	5000	4.4	6910	35000	
F 70 3_196.0		14.3	5000	8.1	5370	35000	7.1	5000	4.0	6970	35000	
F 70 4_216.5		12.9	5000	7.5	2130	35000	6.5	5000	3.7	2860	35000	
F 70 4_234.6		11.9	5000	6.9	2130	35000	6.0	5000	3.5	2860	35000	
F 70 4_280.9		10.0	5000	5.8	2200	35000	5.0	5000	2.9	2940	35000	
F 70 4_304.3		9.2	5000	5.3	2200	35000	4.6	5000	2.7	2940	35000	
F 70 4_372.5		7.5	5000	4.4	2260	35000	3.8	5000	2.2	3000	35000	
F 70 4_403.5		6.9	5000	4.0	2260	35000	3.5	5000	2.0	3000	35000	
F 70 4_471.2		5.9	5000	3.4	2300	35000	3.0	5000	1.7	3040	35000	
F 70 4_510.4		5.5	5000	3.2	2300	35000	2.7	5000	1.6	3040	35000	
F 70 4_606.8		4.6	5000	2.7	2340	35000	2.3	5000	1.3	3070	35000	
F 70 4_657.4		4.3	5000	2.5	2340	35000	2.1	5000	1.2	3070	35000	
F 70 4_759.0		3.7	5000	2.1	2360	35000	1.8	5000	1.1	3090	35000	
F 70 4_822.2		3.4	5000	2.0	2360	35000	1.7	5000	1.0	3090	35000	
F 70 4_899.4		3.1	5000	1.8	2370	35000	1.6	5000	0.90	3110	35000	
F 70 4_974.4		2.9	5000	1.7	2370	35000	1.4	5000	0.83	3110	35000	
F 70 4_1091		2.6	5000	1.5	2390	35000	1.3	5000	0.74	3120	35000	
F 70 4_1182		2.4	5000	1.4	2390	35000	1.2	5000	0.69	3120	35000	
F 70 4_1368		2.0	5000	1.2	2400	35000	1.0	5000	0.59	3130	35000	
F 70 4_1481		1.9	5000	1.1	2400	35000	0.95	5000	0.55	3130	35000	
F 70 4_1585		1.8	5000	1.0	2410	35000	0.88	5000	0.51	3140	35000	
F 70 4_1717		1.6	5000	0.95	2410	35000	0.82	5000	0.47	3140	35000	
F 70 4_2019		1.4	5000	0.80	2420	35000	0.69	5000	0.40	3150	35000	
F 70 4_2188		1.3	5000	0.74	2420	35000	0.64	5000	0.37	3150	35000	



	i	$n_1 = 900 \text{ min}^{-1}$					$n_1 = 500 \text{ min}^{-1}$					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
F 70 3_10.0		90	3200	33	4870	21660	50	3200	18.1	7000	27010	109
F 70 3_10.9		83	3450	32	4970	21670	46	3450	17.9	7000	27160	
F 70 3_12.8		70	3850	31	2540	22530	39	3600	15.9	7000	28320	
F 70 3_13.9		65	4200	31	2380	22350	36	3900	15.8	7000	28290	
F 70 3_16.3		55	4000	25	3830	24520	31	4000	13.9	7000	30730	
F 70 3_17.7		51	4350	25	3750	24380	28.2	4350	13.9	7000	30760	
F 70 3_20.9		43	4000	19.5	5210	26970	23.9	4000	10.8	7000	33650	
F 70 3_22.6		40	4350	19.6	5130	26900	22.1	4350	10.9	7000	33750	
F 70 3_24.6		37	4000	16.5	5630	28710	20.3	4000	9.2	7000	35000	
F 70 3_27.7		32	5000	18.4	7000	28090	18.1	4650	9.5	7000	35000	
F 70 3_30.0		30	5000	16.9	7000	28750	16.7	5000	9.4	7000	35000	
F 70 3_35.4		25.4	5000	14.4	7000	31010	14.1	5000	8.0	7000	35000	
F 70 3_38.4		23.4	5000	13.2	7000	31740	13.0	5000	7.4	7000	35000	
F 70 3_45.2		19.9	5000	11.2	7000	34090	11.1	5000	6.2	7000	35000	
F 70 3_49.0		18.4	5000	10.4	7000	34890	10.2	5000	5.8	7000	35000	
F 70 3_57.7		15.6	5000	8.8	7000	35000	8.7	5000	4.9	7000	35000	
F 70 3_62.5		14.4	5000	8.1	7000	35000	8.0	5000	4.5	7000	35000	
F 70 3_67.9		13.3	5000	7.5	7000	35000	7.4	5000	4.2	7000	35000	
F 70 3_73.6		12.2	5000	6.9	7000	35000	6.8	5000	3.8	7000	35000	
F 70 3_85.4		10.5	5000	6.0	7000	35000	5.9	5000	3.3	7000	35000	
F 70 3_92.5		9.7	5000	5.5	7000	35000	5.4	5000	3.1	7000	35000	
F 70 3_101.2		8.9	5000	5.0	7000	35000	4.9	5000	2.8	7000	35000	
F 70 3_109.6		8.2	5000	4.6	7000	35000	4.6	5000	2.6	7000	35000	
F 70 3_122.7		7.3	5000	4.1	7000	35000	4.1	5000	2.3	7000	35000	
F 70 3_133.0		6.8	5000	3.8	7000	35000	3.8	5000	2.1	7000	35000	
F 70 3_153.8		5.9	5000	3.3	7000	35000	3.3	5000	1.8	7000	35000	
F 70 3_166.7		5.4	5000	3.0	7000	35000	3.0	5000	1.7	7000	35000	
F 70 3_180.9		5.0	5000	2.8	7000	35000	2.8	5000	1.6	7000	35000	
F 70 3_196.0		4.6	5000	2.6	7000	35000	2.6	5000	1.4	7000	35000	
F 70 4_216.5		4.2	5000	2.4	3430	35000	2.3	5000	1.3	3500	35000	
F 70 4_234.6		3.8	5000	2.2	3430	35000	2.1	5000	1.2	3500	35000	
F 70 4_280.9		3.2	5000	1.9	3500	35000	1.8	5000	1.0	3500	35000	
F 70 4_304.3		3.0	5000	1.7	3500	35000	1.6	5000	0.95	3500	35000	
F 70 4_372.5		2.4	5000	1.4	3500	35000	1.3	5000	0.78	3500	35000	
F 70 4_403.5		2.2	5000	1.3	3500	35000	1.2	5000	0.72	3500	35000	
F 70 4_471.2		1.9	5000	1.1	3500	35000	1.1	5000	0.62	3500	35000	
F 70 4_510.4		1.8	5000	1.0	3500	35000	0.98	5000	0.57	3500	35000	
F 70 4_606.8		1.5	5000	0.86	3500	35000	0.82	5000	0.48	3500	35000	
F 70 4_657.4		1.4	5000	0.79	3500	35000	0.76	5000	0.44	3500	35000	
F 70 4_759.0		1.2	5000	0.69	3500	35000	0.66	5000	0.38	3500	35000	
F 70 4_822.2		1.1	5000	0.63	3500	35000	0.61	5000	0.35	3500	35000	
F 70 4_899.4		1.0	5000	0.58	3500	35000	0.56	5000	0.32	3500	35000	
F 70 4_974.4		0.92	5000	0.54	3500	35000	0.51	5000	0.30	3500	35000	
F 70 4_1091		0.82	5000	0.48	3500	35000	0.46	5000	0.27	3500	35000	
F 70 4_1182		0.76	5000	0.44	3500	35000	0.42	5000	0.25	3500	35000	
F 70 4_1368		0.66	5000	0.38	3500	35000	0.37	5000	0.21	3500	35000	
F 70 4_1481		0.61	5000	0.35	3500	35000	0.34	5000	0.20	3500	35000	
F 70 4_1585		0.57	5000	0.33	3500	35000	0.32	5000	0.18	3500	35000	
F 70 4_1717		5.26	5000	3.05	3500	35000	2.92	5000	1.70	3500	35000	
F 70 4_2019		0.45	5000	0.26	3500	35000	0.25	5000	0.14	3500	35000	
F 70 4_2188		0.41	5000	0.24	3500	35000	0.23	5000	0.13	3500	35000	

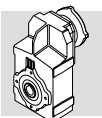
**F 80****8000 Nm**

	i	$n_1 = 2800 \text{ min}^{-1}$					$n_1 = 1400 \text{ min}^{-1}$					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
F 80 3_10.3		272	3250	100	610	17240	136	4100	63	220	21750	113
F 80 3_11.2		250	3520	99	620	17760	125	4440	63	230	21680	
F 80 3_12.9		217	3560	87	670	18880	109	4480	55	350	23080	
F 80 3_14.0		200	3850	87	700	18830	100	4860	55	310	22970	
F 80 3_16.2		173	3760	73	760	20320	86	4740	46	430	24840	
F 80 3_17.6		159	4000	72	730	20260	80	5140	46	410	24730	
F 80 3_20.3		138	4060	63	780	21680	69	5120	40	440	26480	
F 80 3_22.0		127	4400	63	780	21600	64	5540	40	470	26380	
F 80 3_25.2		111	4230	53	700	23290	56	5330	33	360	28470	
F 80 3_28.8		97	6550	72	4590	20500	49	8000	44	5890	25350	
F 80 3_31.3		89	7100	72	4590	20000	45	8000	40	6040	26000	
F 80 3_36.0		78	7250	64	4560	21450	39	8000	35	6110	28090	
F 80 3_39.0		72	6700	54	4890	23010	36	8000	32	6240	28790	
F 80 3_45.3		62	7900	55	4440	22740	31	8000	28	6240	31120	
F 80 3_49.1		57	8000	52	4750	23150	28.5	8000	26	6360	31880	
F 80 3_56.7		49	8000	45	4780	25150	24.7	8000	22	6390	34260	
F 80 3_61.5		46	8000	41	4890	25790	22.8	8000	21	6500	35080	
F 80 3_70.4		40	8000	36	4850	27800	19.9	8000	18.0	6460	37470	
F 80 3_76.3		37	8000	33	4950	28490	18.3	8000	16.6	6560	38360	
F 80 3_85.2		33	8000	30	4940	30280	16.4	8000	14.8	6550	40480	
F 80 3_92.3		30	8000	27	5040	31030	15.2	8000	13.7	6640	41450	
F 80 3_105.0		26.7	8000	24	5000	33150	13.3	8000	12.0	6610	43970	
F 80 3_113.8		24.6	8000	22	5090	33950	12.3	8000	11.1	6700	45000	
F 80 3_122.5		22.9	8000	21	5020	35370	11.4	8000	10.3	6630	45000	
F 80 3_132.7		21.1	8000	19.1	5110	36230	10.6	8000	9.5	6720	45000	
F 80 3_147.9		18.9	8000	17.1	5060	38230	9.5	8000	8.6	6660	45000	
F 80 3_160.2		17.5	8000	15.8	5140	39140	8.7	8000	7.9	6750	45000	
F 80 3_184.6		15.2	8000	13.7	5090	41790	7.6	8000	6.9	6700	45000	
F 80 3_200.0		14.0	8000	12.7	5180	42790	7.0	8000	6.3	6780	45000	
F 80 4_218.5		12.8	8000	11.9	1020	45000	6.4	8000	5.9	2400	45000	
F 80 4_273.9		10.2	8000	9.5	1470	45000	5.1	8000	4.7	2680	45000	
F 80 4_296.7		9.4	8000	8.8	1470	45000	4.7	8000	4.4	2680	45000	
F 80 4_353.7		7.9	8000	7.3	1850	45000	4.0	8000	3.7	2770	45000	
F 80 4_383.2		7.3	8000	6.8	1850	45000	3.7	8000	3.4	2770	45000	
F 80 4_451.5		6.2	8000	5.8	2040	45000	3.1	8000	2.9	2820	45000	
F 80 4_489.1		5.7	8000	5.3	2040	45000	2.9	8000	2.7	2820	45000	
F 80 4_563.9		5.0	8000	4.6	2130	45000	2.5	8000	2.3	2860	45000	
F 80 4_610.9		4.6	8000	4.3	2130	45000	2.3	8000	2.1	2860	45000	
F 80 4_714.9		3.9	8000	3.6	2160	45000	2.0	8000	1.8	2890	45000	
F 804_774.4		3.6	8000	3.4	2160	45000	1.8	8000	1.7	2890	45000	
F 80 4_897.3		3.1	8000	2.9	2200	45000	1.6	8000	1.4	2930	45000	
F 80 4_972.0		2.9	8000	2.7	2200	45000	1.4	8000	1.3	2930	45000	
F 80 4_1058		2.6	8000	2.5	2210	45000	1.3	8000	1.2	2950	45000	
F 80 4_1146		2.4	8000	2.3	2210	45000	1.2	8000	1.1	2950	45000	
F 80 4_1277		2.2	8000	2.0	2230	45000	1.1	8000	1.0	2960	45000	
F 80 4_1384		2.0	8000	1.9	2230	45000	1.0	8000	0.94	2960	45000	
F 80 4_1578		1.8	8000	1.6	2240	45000	0.89	8000	0.82	2970	45000	
F 80 4_1709		1.6	8000	1.5	2240	45000	0.82	8000	0.76	2970	45000	
F 80 4_1834		1.5	8000	1.4	2250	45000	0.76	8000	0.71	2980	45000	
F 80 4_1987		1.4	8000	1.3	2250	45000	0.70	8000	0.65	2980	45000	



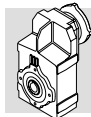
	i	$n_1 = 900 \text{ min}^{-1}$					$n_1 = 500 \text{ min}^{-1}$					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
F 80 3_10.3		87	4740	47	—	24730	49	5770	32	—	29310	113
F 80 3_11.2		80	5140	47	—	24630	45	6250	32	—	29180	
F 80 3_12.9		70	5200	41	—	26210	39	6320	28	—	31060	
F 80 3_14.0		64	5620	41	—	26100	36	6800	27	—	30970	
F 80 3_16.2		56	5490	34	—	28220	31	6250	22	1540	34170	
F 80 3_17.6		51	5960	34	—	28080	28.4	6800	22	1410	30030	
F 80 3_20.3		44	5930	30	—	30090	24.6	6250	17.4	3710	37270	
F 80 3_22.0		41	6420	30	—	29960	22.7	6800	17.5	3590	37220	
F 80 3_25.2		36	6175	25	—	32360	19.8	6250	14.0	4660	40450	
F 80 3_28.8		31	8000	28	7000	30980	17.4	8000	15.7	7000	39620	
F 80 3_31.3		28.8	8000	26	7000	31740	16.0	8000	14.4	7000	40560	
F 80 3_36.0		25.0	8000	23	7000	34070	13.9	8000	12.6	7000	43270	
F 80 3_39.0		23.1	8000	21	7000	34890	12.8	8000	11.6	7000	44300	
F 80 3_45.3		19.9	8000	18.0	7000	37490	11.0	8000	10.0	7000	45000	
F 80 3_49.1		18.3	8000	16.6	7000	38390	10.2	8000	9.2	7000	45000	
F 80 3_56.7		15.9	8000	14.3	7000	41050	8.8	8000	8.0	7000	45000	
F 80 3_61.5		14.6	8000	13.2	7000	42030	8.1	8000	7.3	7000	45000	
F 80 3_70.4		12.8	8000	11.6	7000	44690	7.1	8000	6.4	7000	45000	
F 80 3_76.3		11.8	8000	10.7	7000	45000	6.6	8000	5.9	7000	45000	
F 80 3_85.2		10.6	8000	9.5	7000	45000	5.9	8000	5.3	7000	45000	
F 80 3_92.3		9.8	8000	8.8	7000	45000	5.4	8000	4.9	7000	45000	
F 80 3_105.0		8.6	8000	7.7	7000	45000	4.8	8000	4.3	7000	45000	
F 80 3_113.8		7.9	8000	7.1	7000	45000	4.4	8000	4.0	7000	45000	
F 80 3_122.5		7.3	8000	6.6	7000	45000	4.1	8000	3.7	7000	45000	
F 80 3_132.7		6.8	8000	6.1	7000	45000	3.8	8000	3.4	7000	45000	
F 80 3_147.9		6.1	8000	5.5	7000	45000	3.4	8000	3.1	7000	45000	
F 80 3_160.2		5.6	8000	5.1	7000	45000	3.1	8000	2.8	7000	45000	
F 80 3_184.6		4.9	8000	4.4	7000	45000	2.7	8000	2.4	7000	45000	
F 80 3_200.0		4.5	8000	4.1	7000	45000	2.5	8000	2.3	7000	45000	
F 80 4_218.5		4.1	8000	3.8	3130	45000	2.3	8000	2.1	3500	45000	
F 80 4_273.9		3.3	8000	3.0	3240	45000	1.8	8000	1.7	3500	45000	
F 80 4_296.7		3.0	8000	2.8	3240	45000	1.7	8000	1.6	3500	45000	
F 80 4_353.7		2.5	8000	2.4	3330	45000	1.4	8000	1.3	3500	45000	
F 80 4_383.2		2.3	8000	2.2	3330	45000	1.3	8000	1.2	3500	45000	
F 80 4_451.5		2.0	8000	1.8	3380	45000	1.1	8000	1.0	3500	45000	
F 80 4_489.1		1.8	8000	1.7	3380	45000	1.0	8000	0.95	3500	45000	
F 80 4_563.9		1.6	8000	1.5	3420	45000	0.89	8000	0.82	3500	45000	
F 80 4_610.9		1.5	8000	1.4	3420	45000	0.82	8000	0.76	3500	45000	
F 80 4_714.9		1.3	8000	1.2	3460	45000	0.70	8000	0.65	3500	45000	
F 80 4_774.4		1.2	8000	1.1	3460	45000	0.65	8000	0.60	3500	45000	
F 80 4_897.3		1.0	8000	0.93	3490	45000	0.56	8000	0.52	3500	45000	
F 80 4_972.0		0.93	8000	0.86	3490	45000	0.51	8000	0.48	3500	45000	
F 80 4_1058		0.85	8000	0.79	3500	45000	0.47	8000	0.44	3500	45000	
F 80 4_1146		0.79	8000	0.73	3500	45000	0.44	8000	0.40	3500	45000	
F 80 4_1277		0.70	8000	0.65	3500	45000	0.39	8000	0.36	3500	45000	
F 80 4_1384		0.65	8000	0.60	3500	45000	0.36	8000	0.34	3500	45000	
F 80 4_1578		0.57	8000	0.53	3500	45000	0.32	8000	0.29	3500	45000	
F 80 4_1709		0.53	8000	0.49	3500	45000	0.29	8000	0.27	3500	45000	
F 80 4_1834		0.49	8000	0.46	3500	45000	0.27	8000	0.25	3500	45000	
F 80 4_1987		0.45	8000	0.42	3500	45000	0.25	8000	0.23	3500	45000	

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)
 (-) Contact our technical service department advising radial load data (rotation direction, orientation, position)
 (-) Nehmen Sie bitte Kontakt mit unserem Applikationsdienst und Querkraftsdaten angeben (Drehrichtung, Orientierung, Anordnung)
 (-) Consulter notre service technique en donnant les détails concernant la charge radiale (sens de rotation, indexage, position)

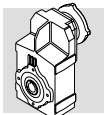
**F 90****14000 Nm**

	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
F 90 3_10.3		272	6500	200	5480	23780	136	8000	123	8000	29280	117
F 90 3_11.1		252	7150	204	5280	23290	126	8800	125	7770	28680	
F 90 3_13.4		209	7550	178	4880	24950	104	9300	110	7280	30710	
F 90 3_14.5		193	8100	177	5000	24650	97	10000	109	7400	30310	
F 90 3_16.5		170	8400	161	4540	25970	85	10300	99	6960	32040	
F 90 3_17.9		156	8950	158	4560	25700	78	11000	97	7180	31670	
F 90 3_20.6		136	9200	141	3980	27360	68	11300	87	6260	33720	
F 90 3_22.3		126	9750	138	4280	27120	63	12000	85	6590	33400	
F 90 3_25.4		110	10050	125	3620	28730	55	12000	75	6310	35980	
F 90 3_28.6		98	9750	108	9800	30870	49	12000	66	12390	38010	
F 90 3_31.0		90	10550	108	9800	30310	45	13000	66	12390	37290	
F 90 3_37.4		75	10950	93	9820	32820	37	13500	57	12420	40380	
F 90 3_40.5		69	11900	93	9820	32050	35	14000	55	12510	40550	
F 90 3_46.1		61	12050	83	9840	34290	30	14000	48	12560	43590	
F 90 3_49.9		56	13050	83	9840	33470	28.1	14000	44	12710	44670	
F 90 3_57.3		49	13050	72	9810	36320	24.4	14000	39	12680	48090	
F 90 3_62.1		45	14000	71	9830	35630	22.5	14000	36	12830	49260	
F 90 3_70.8		40	14000	63	9830	38520	19.8	14000	31	12830	52680	
F 90 3_76.7		37	14000	58	9960	39500	18.3	14000	29	12960	53950	
F 90 3_88.4		32	14000	50	9930	42780	15.8	14000	25	12930	55000	
F 90 3_95.8		29.2	14000	46	10050	43840	14.6	14000	23	13050	55000	
F 90 3_103.3		27.1	14000	43	9960	45920	13.6	14000	21	12960	55000	
F 90 3_111.9		25.0	14000	40	10080	47050	12.5	14000	19.8	13080	55000	
F 90 3_126.8		22.1	14000	35	10030	50250	11.0	14000	17.5	13030	55000	
F 90 3_137.3		20.4	14000	32	10140	51470	10.2	14000	16.1	13140	55000	
F 90 3_150.3		18.6	14000	29	10080	54040	9.3	14000	14.7	13080	55000	
F 90 3_162.8		17.2	14000	27	10220	55000	8.6	14000	13.6	13190	55000	
F 90 3_179.2		15.6	14000	25	10180	55000	7.8	14000	12.4	13100	55000	
F 90 3_194.2		14.4	14000	23	10220	55000	7.2	14000	11.4	13210	55000	
F 90 4_213.6		13.1	14000	21	—	55000	6.6	14000	10.6	—	55000	
F 90 4_231.4		12.1	14000	19.6	—	55000	6.1	14000	9.8	—	55000	
F 90 4_268.7		10.4	14000	16.9	—	55000	5.2	14000	8.5	420	55000	
F 90 4_291.1		9.6	14000	15.6	—	55000	4.8	14000	7.8	420	55000	
F 90 4_361.8		7.7	14000	12.6	—	55000	3.9	14000	6.3	990	55000	
F 90 4_392.0		7.1	14000	11.6	—	55000	3.6	14000	5.8	990	55000	
F 90 4_457.5		6.1	14000	9.9	—	55000	3.1	14000	5.0	1390	55000	
F 90 4_495.6		5.6	14000	9.2	—	55000	2.8	14000	4.6	1390	55000	
F 90 4_577.5		4.8	14000	7.9	—	55000	2.4	14000	3.9	1600	55000	
F 90 4_625.6		4.5	14000	7.3	—	55000	2.2	14000	3.6	1600	55000	
F 90 4_714.0		3.9	14000	6.4	—	55000	2.0	14000	3.2	1800	55000	
F 90 4_773.4		3.6	14000	5.9	—	55000	1.8	14000	2.9	1800	55000	
F 90 4_910.2		3.1	14000	5.0	—	55000	1.5	14000	2.5	2020	55000	
F 90 4_986.0		2.8	14000	4.6	—	55000	1.4	14000	2.3	2020	55000	
F 90 4_1112		2.5	14000	4.1	—	55000	1.3	14000	2.0	2110	55000	
F 90 4_1205		2.3	14000	3.8	—	55000	1.2	14000	1.9	2110	55000	
F 90 4_1318		2.1	14000	3.4	—	55000	1.1	14000	1.7	2220	55000	
F 90 4_1428		2.0	14000	3.2	—	55000	0.98	14000	1.6	2220	55000	
F 90 4_1571		1.8	14000	2.9	—	55000	0.89	14000	1.4	2260	55000	
F 90 4_1702		1.6	14000	2.7	—	55000	0.82	14000	1.3	2260	55000	
F 90 4_1937		1.4	14000	2.3	—	55000	0.72	14000	1.2	2300	55000	
F 90 4_2099		1.3	14000	2.2	—	55000	0.67	14000	1.1	2300	55000	

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)
 (-) Contact our technical service department advising radial load data (rotation direction, orientation, position)
 (-) Nehmen Sie bitte Kontakt mit unserem Applikationsdienst und Querkraftsdaten angeben (Drehrichtung, Orientierung, Anordnung)
 (-) Consulter notre service technique en donnant les détails concernant la charge radiale (sens de rotation, indexage, position)



	i	$n_1 = 900 \text{ min}^{-1}$					$n_1 = 500 \text{ min}^{-1}$					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
F 90 3_10.3		87	9150	90	10010	33400	49	9600	53	15000	41900	117
F 90 3_11.1		81	10050	92	9780	32740	45	10400	53	15000	41630	
F 90 3_13.4		67	10600	80	9270	35090	37	12500	53	12730	42090	
F 90 3_14.5		62	11400	80	9390	34630	34	13550	53	12720	41390	
F 90 3_16.5		55	11750	72	8890	36600	30	12300	42	14580	46420	
F 90 3_17.9		50	12550	71	9140	36180	27.9	13150	41	14820	46160	
F 90 3_20.6		44	12200	60	9100	39650	24.3	12200	33	15000	51030	
F 90 3_22.3		40	13200	60	9120	38970	22.4	13200	33	15000	50650	
F 90 3_25.4		35	12000	48	10430	43830	19.7	12000	27	15000	55000	
F 90 3_28.6		31	13700	49	14400	43400	17.5	14000	28	15000	55000	
F 90 3_31.0		29.0	14000	46	14540	43980	16.1	14000	26	15000	55000	
F 90 3_37.4		24.1	14000	38	14650	48390	13.4	14000	21	15000	55000	
F 90 3_40.5		22.2	14000	35	14820	49570	12.3	14000	19.5	15000	55000	
F 90 3_46.1		19.5	14000	31	14870	52960	10.8	14000	17.2	15000	55000	
F 90 3_49.9		18.0	14000	29	15000	54240	10.0	14000	15.8	15000	55000	
F 90 3_57.3		15.7	14000	25	14990	55000	8.7	14000	13.8	15000	55000	
F 90 3_62.1		14.5	14000	23	15000	55000	8.1	14000	12.7	15000	55000	
F 90 3_70.8		12.7	14000	20.1	15000	55000	7.1	14000	11.2	15000	55000	
F 90 3_76.7		11.7	14000	18.6	15000	55000	6.5	14000	10.3	15000	55000	
F 90 3_88.4		10.2	14000	16.1	15000	55000	5.7	14000	8.9	15000	55000	
F 90 3_95.8		9.4	14000	14.9	15000	55000	5.2	14000	8.3	15000	55000	
F 90 3_103.3		8.7	14000	13.8	15000	55000	4.8	14000	7.7	15000	55000	
F 90 3_111.9		8.0	14000	12.7	15000	55000	4.5	14000	7.1	15000	55000	
F 90 3_126.8		7.1	14000	11.2	15000	55000	3.9	14000	6.2	15000	55000	
F 90 3_137.3		6.6	14000	10.4	15000	55000	3.6	14000	5.8	15000	55000	
F 90 3_150.3		6.0	14000	9.5	15000	55000	3.3	14000	5.3	15000	55000	
F 90 3_162.8		5.5	14000	8.7	15000	55000	3.1	14000	4.9	15000	55000	
F 90 3_179.2		5.0	14000	7.9	15000	55000	2.8	14000	4.4	15000	55000	
F 90 3_194.2		4.6	14000	7.3	15000	55000	2.6	14000	4.1	15000	55000	
F 90 4_213.6		4.2	14000	6.8	810	55000	2.3	14000	3.8	2350	55000	
F 90 4_231.4		3.9	14000	6.3	810	55000	2.2	14000	3.5	2350	55000	
F 90 4_268.7		3.3	14000	5.4	1390	55000	1.9	14000	3.0	2920	55000	
F 90 4_291.1		3.1	14000	5.0	1390	55000	1.7	14000	2.8	2920	55000	
F 90 4_361.8		2.5	14000	4.0	1960	55000	1.4	14000	2.2	3390	55000	
F 90 4_392.0		2.3	14000	3.7	1960	55000	1.3	14000	2.1	3390	55000	
F 90 4_457.5		2.0	14000	3.2	2360	55000	1.1	14000	1.8	3490	55000	
F 90 4_495.6		1.8	14000	2.9	2360	55000	1.0	14000	1.6	3490	55000	
F 90 4_577.5		1.6	14000	2.5	2570	55000	0.87	14000	1.4	3500	55000	
F 90 4_625.6		1.4	14000	2.3	2570	55000	0.80	14000	1.3	3500	55000	
F 90 4_714.0		1.3	14000	2.0	2770	55000	0.70	14000	1.1	3500	55000	
F 90 4_773.4		1.2	14000	1.9	2770	55000	0.65	14000	1.0	3500	55000	
F 90 4_910.2		0.99	14000	1.6	2840	55000	0.55	14000	0.89	3500	55000	
F 90 4_986.0		0.91	14000	1.5	2840	55000	0.51	14000	0.82	3500	55000	
F 90 4_1112		0.81	14000	1.3	2860	55000	0.45	14000	0.73	3500	55000	
F 90 4_1205		0.75	14000	1.2	2860	55000	0.41	14000	0.67	3500	55000	
F 90 4_1318		0.68	14000	1.1	2890	55000	0.38	14000	0.62	3500	55000	
F 90 4_1428		0.63	14000	1.0	2890	55000	0.35	14000	0.57	3500	55000	
F 90 4_1571		0.57	14000	0.93	2900	55000	0.32	14000	0.52	3500	55000	
F 90 4_1702		0.53	14000	0.86	2900	55000	0.29	14000	0.48	3500	55000	
F 90 4_1937		0.46	14000	0.75	2910	55000	0.26	14000	0.42	3500	55000	
F 90 4_2099		0.43	14000	0.70	2910	55000	0.24	14000	0.39	3500	55000	



28 - PREDISPOSIZIONI MOTORE

Nelle tabelle (B18) e (B19) vengono riportati gli abbinamenti motore possibili in termini puramente geometrici.

La scelta del motoriduttore deve essere effettuata seguendo le istruzioni specificate al paragrafo 11, rispettando in particolare la condizione $S \geq fs$.

28 - MOTOR AVAILABILITY

Please be aware that motor-gear box combinations resulting from charts (B18) and (B19) are purely based on geometrical compatibility.

When selecting a gearmotor, refer to procedure specified at paragraph 11 and observe particularly the condition $S \geq fs$.

28 - BAUMÖGLICHKEITEN

In den Tabellen (B18) und (B19) werden die von den Größen her gesehenen möglichen Passungen angegeben.

Die angemessene Getriebewahl muss unter Befolgung der im Paragraph 11 gegebenen Anleitungen und auf der Grundlage der Auswahltafel der technischen Daten erfolgen.

28 - PREDISPOSIZIONI MOTEUR

Dans les tableaux (B18) et (B19) sont indiqués les accouplements possibles en termes des dimensions.

Le choix le plus approprié du motoréducteur à utiliser doit être effectué selon les indications du paragraphe 11, ainsi qu'en fonction des tableaux de sélection, respectant en particulier la condition $S \geq fs$.

(B18)

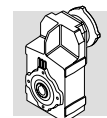
	 IEC (IM B5)											
	P63	P71	P80	P90	P100	P112	P132	P160	P180	P200	P225	P250
F 10 2	7.4_127.1	7.4_127.1	7.4_91.5	7.4_91.5	7.4_91.5	7.4_91.5						
F 20 2	8.7_132.2 (14.8)	8.7_132.2 (14.8)	6.4_114.3	6.4_114.3	6.4_114.3	6.4_114.3						
F 20 3	172.6_545.3	172.6_545.3	172.6_545.3	172.6_545.3	172.6_545.3	172.6_545.3						
F 30 2	12.0_35.0	12.0_35.0	6.9_35.0	6.9_35.0	6.9_35.0	6.9_35.0						
F 30 3	69.1_374.4	69.1_374.4	40.2_374.4	40.2_374.4	40.2_374.4	40.2_374.4						
F30 4	462.6_1539	462.6_1539	462.6_1539	462.6_1539	462.6_1539	462.6_1539						
F 40 2	15.1_35.3	15.1_35.3	6.7_35.3	6.7_35.3	6.7_35.3	6.7_35.3	6.7_29.9					
F 40 3	84.9_344.8	84.9_344.8	37.9_344.8	37.9_344.8	37.9_344.8	37.9_344.8	37.9_168.7					
F 40 4	433.7_1411	433.7_1411	433.7_1411	433.7_1411	433.7_1411	433.7_1411						
F 50 2	19.5_30.7	19.5_30.7	7.2_30.7	7.2_30.7	7.2_30.7	7.2_30.7	7.2_30.7	7.2_30.7	7.2_30.7			
F 50 3	105.1_352.5	105.1_352.5	38.9_352.5	38.9_352.5	38.9_352.5	38.9_352.5	38.9_202.4	38.9_202.4	38.9_202.4			
F 50 4	429.1_1439	429.1_1439	429.1_1439	429.1_1439	429.1_1439	429.1_1439						
F 60 3	98.2_280.7	98.2_280.7	11.8_280.7 (29.6_32.1)	11.8_280.7 (29.6_32.1)	11.8_280.7 (29.6_32.1)	11.8_280.7 (29.6_32.1)	9.0_201.4	9.0_201.4	9.0_201.4			
F 60 4	315.4_1141	315.4_1141	315.4_1141	315.4_1141	315.4_1141	315.4_1141						
F 70 3			85.4_196.0	85.4_196.0	85.4_196.0	85.4_196.0	16.3_196.0 (27.7_38.4)	10.0_196.0	10.0_196.0	10.0_49.0 (20.9_24.6)		
F 70 4	372.5_2188	372.5_2188	216.5_2188	216.5_2188	216.5_2188	216.5_2188	216.5_822.2					
F 80 3			105.0_200.0	105.0_200.0	105.0_200.0	105.0_200.0	20.3_200 (28.8_49.1)	12.9_200 (28.8_31.3)	10.3_200.0	10.3_132.7	10.3_132.7	
F 80 4	451.5_1987	451.5_1987	218.5_1987	218.5_1987	218.5_1987	218.5_1987	218.5_972					
F 90 3			126.8_194.2	126.8_194.2	126.8_194.2	126.8_194.2	25.4_194.2 (28.6_62.1)	16.5_194.2 (28.6_40.5)	10.3_194.2	10.3_162.8	10.3_162.8	10.3_162.8
F 90 4	577.5_2099	577.5_2099	213.6_2099	213.6_2099	213.6_2099	213.6_2099	213.6_1205	213.6_1205	213.6_1205			

I numeri fra parentesi si riferiscono ai rapporti per i quali non sono applicabili le grandezze motore indicate.

Combinations featuring the gear ratios within brackets are not possible.

Die Nummer in Klammern beziehen sich auf die Übersetzungen, für die die angegebenen Motorgrößen nicht anzusetzen sind.

Le nombres entre parenthèses se réfèrent aux rapports pour lesquels les tailles moteur indiquées ne sont pas applicables.



(B19)

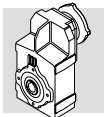
						
	M05	M1	M2	M3	M4	M5
F 10 2	7.4_127.1	7.4_127.1	7.4_91.5	7.4_91.5		
F 20 2	8.7_132.2 (14.8)	8.7_132.2 (14.8)	6.4_114.3	6.4_114.3		
F 20 3	172.6_545.3	172.6_545.3	172.6_545.3	172.6_545.3		
F 30 2		12.0_35.0	6.9_35.0	6.9_35.0		
F 30 3		69.1_374.4	40.2_374.4	40.2_374.4		
F 30 4	462.6_1539	462.6_1539	462.6_1539	462.6_1539		
F 40 2		15.1_35.3	6.7_35.3	6.7_35.3	6.7_29.9	
F 40 3		84.9_344.8	37.9_344.8	37.9_344.8	37.9_168.7	
F 40 4	433.7_1411	433.7_1411	433.7_1411	433.7_1411		
F 50 2		19.5_30.7	7.2_30.7	7.2_30.7	7.2_30.7	
F 50 3		105.1_352.5	38.9_352.5	38.9_352.5	38.9_202.4	
F 50 4		429.1_1439	429.1_1439	429.1_1439		
F 60 3			11.8_280.7 (29.6_32.1)	11.8_280.7 (29.6_32.1)	9_201.4	9_201.4
F 60 4		315.4_1141	315.4_1141	315.4_1141	315.4_1141	
F 70 3			85.4_196	85.4_196	16.3_196.0 (27.7_38.4)	10.0_196.0
F 70 4		372.5_2188	216.5_2188	216.5_2188	216.5_822.2	
F 80 3					20.3_200.0 (28.8_49.1)	12.9_200.0 (28.8_31.3)
F 80 4		451.5_1987	218.5_1987	218.5_1987	218.5_972.0	
F 90 3					25.4_194.2 (28.6_62.1)	16.5_194.2 (28.6_40.5)
F 90 4			213.6_2099	213.6_2099	213.6_1205	

I numeri fra parentesi si riferiscono ai rapporti per i quali non sono applicabili le grandezze motore indicate.

Combinations featuring the gear ratios within brackets are not possible.

Die Nummer in Klammern beziehen sich auf die Übersetzungen, für die die angegebenen Motor größen nicht anzusetzen sind.

Le nombres entre parenthèses se réfèrent aux rapports pour lesquels les tailles moteur indiquées ne sont pas applicables.



29 - MOMENTO D'INERZIA

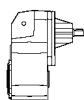
Le tabelle seguenti indicano i valori del momento d'inerzia J_r [Kgm^2] riferiti all'asse veloce del riduttore; per una migliore facilità di lettura riportiamo le definizioni dei simboli usati.



I valori riferiti a questo simbolo sono da attribuire al riduttore compatto senza motore. In questo caso, per avere il momento d'inerzia complessivo del motoriduttore, si dovrà sommare il valore corrispondente al riduttore compatto, a quello del motore da applicare (dato reperibile nelle tabelle delle caratteristiche tecniche dei motori elettrici).



I valori relativi a questi simboli sono da attribuire al riduttore predisposto per attacco motore (grandezza IEC...).



I valori attribuiti al riduttore sono riferiti a questo simbolo.

29 - MOMENT OF INERTIA

The following charts indicate moment of inertia values J_r [Kgm^2] referred to the gear unit high speed shaft. A key to the symbols used follows:

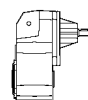


Values under this icon refer to compact gear units, without motor.

To obtain the overall moment of inertia for the gearmotor just add the value of the inertia for the specific M style motor, given in the relevant rating chart.



Values under this symbol refer to gearboxes with IEC motor adaptor (IEC size...).



This symbol refers to gearbox values.

29 - TRÄGHEITSMOMENT

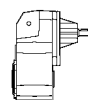
Die in den folgenden Tabellen angegebenen Trägheitsmomente J_r [Kgm^2] beziehen sich auf die Getriebeantriebsachse. Um das Lesen der Tabellen zu erleichtern, werden folgende Symbole verwendet:



Kompaktgetriebe ohne Motor. In diesem Fall muß man, um das Gesamtträgheitsmoment des Getriebemotors zu erhalten, den dem Kompaktgetriebe mit der gewählten Übersetzung entsprechenden Wert mit dem Wert des anzuschließenden Motors addieren (dieser Wert kann den Elektromotorauswahltabellen entnommen werden).



Nur Getriebe vorbereitet für IEC-Motor (IEC-Größe...).



Dieses Symbol bezieht sich auf Getriebewerte.

29 - MOMENT D'INERTIE

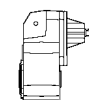
Les tableaux suivants indiquent les valeurs du moment d'inertie J_r [Kgm^2] du niveau de l'arbre rapide du réducteur; pour une plus grande facilité de lecture, nous vous prions de noter les définitions des symboles employés.



Les valeurs liées à symbole sont à assigner au réducteur compact sans moteur. Dans ce cas, afin d'avoir le moment d'inertie total du motoréducteur, on devra additionner la valeur correspondant au réducteur compact, à celle du moteur à assembler (donnée que l'on peut repérer dans les tableaux des caractéristiques techniques des moteurs électriques).



Les valeurs liées à ces symboles sont à assigner au réducteur prédisposé pour accouplement moteur seulement (taille CIE...).



Les valeurs liées au réducteur sont assignées à ce symbole.

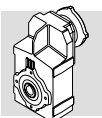
F 10

	i	J ($\cdot 10^{-4}$) [Kgm^2]							
			63	71	80	90	100	112	
F 10 2_7.4	7.4	0.9	2.4	2.4	3.8	3.7	5.0	5.0	1.7
F 10 2_9.8	9.8	0.5	2.0	2.0	3.4	3.3	4.6	4.6	1.4
F 10 2_13.0	13.0	0.3	1.8	1.8	3.2	3.1	4.4	4.4	1.2
F 10 2_14.6	14.6	0.5	2.0	2.0	3.4	3.3	4.6	4.6	1.4
F 10 2_19.3	19.3	0.3	1.8	1.8	3.2	3.1	4.4	4.4	1.2
F 10 2_25.8	25.8	0.2	1.7	1.7	3.1	3.0	4.3	4.3	1.1
F 10 2_33.0	33.0	0.1	1.6	1.6	3.0	2.9	4.2	4.2	1.0
F 10 2_39.6	39.6	0.1	1.6	1.6	3.0	2.9	4.2	4.2	1.0
F 10 2_48.7	48.7	0.07	1.6	1.6	3.0	2.9	4.2	4.2	0.9
F 10 2_63.0	63.0	0.05	1.6	1.6	3.0	2.9	4.2	4.2	0.9
F 10 2_71.1	71.1	0.04	1.5	1.5	2.9	2.8	4.1	4.1	0.9
F 10 2_91.5	91.5	0.03	1.5	1.5	2.9	2.8	4.1	4.1	0.9
F 10 2_106.0	106.0	0.02	1.5	1.5	2.9	2.8	4.1	4.1	0.9
F 10 2_127.1	127.1	0.02	1.5	1.5	2.9	2.8	4.1	4.1	0.9



	i	J ($\cdot 10^{-4}$) [Kgm ²]							
			 IEC						
			63	71	80	90	100	112	
F 20 2_6.4	6.4	4.9	6.4	6.4	7.7	7.7	9	9	6.9
F 20 2_8.7	8.7	2.7	4.2	4.2	5.5	5.5	6.8	6.8	4.7
F 20 2_11.2	11.2	1.7	3.2	3.2	4.5	4.5	5.8	5.8	3.6
F 20 2_14.8	14.8	1.9	3.4	3.4	4.7	4.7	6.0	6.0	3.8
F 20 2_20.2	20.2	1.1	2.6	2.6	3.9	3.9	5.2	5.2	3.0
F 20 2_25.9	25.9	0.7	2.2	2.2	3.5	3.5	4.8	4.8	2.6
F 20 2_33.1	33.1	0.4	1.9	1.9	3.2	3.2	4.5	4.5	2.4
F 20 2_41.8	41.8	0.3	1.8	1.8	3.1	3.1	4.4	4.4	2.2
F 20 2_50.7	50.7	0.2	1.7	1.7	3.0	3.0	4.3	4.3	2.1
F 20 2_61.9	61.9	0.2	1.7	1.7	3.0	3.0	4.3	4.3	2.1
F 20 2_76.8	76.8	0.1	1.6	1.6	2.9	2.9	4.2	4.2	2.0
F 20 2_90.4	90.4	0.08	1.6	1.6	2.9	2.9	4.2	4.2	2.0
F 20 2_114.3	114.3	0.05	1.6	1.6	2.9	2.9	4.2	4.2	2.0
F 20 2_132.2	132.2	0.04	1.5	1.5	2.8	2.8	4.1	4.1	2.0
F 20 3_172.6	172.6	0.03	1.5	1.5	2.8	2.8	4.1	4.1	0.9
F 20 3_209.3	209.3	0.02	1.5	1.5	2.8	2.8	4.1	4.1	0.9
F 20 3_255.3	255.3	0.02	1.5	1.5	2.8	2.8	4.1	4.1	0.9
F 20 3_316.9	316.9	0.02	1.5	1.5	2.8	2.8	4.1	4.1	0.9
F 20 3_372.9	372.9	0.02	1.5	1.5	2.8	2.8	4.1	4.1	0.9
F 20 3_471.7	471.7	0.01	1.5	1.5	2.8	2.8	4.1	4.1	0.9
F 20 3_545.3	545.3	0.01	1.5	1.5	2.8	2.8	4.1	4.1	0.9

	i		J (· 10 ⁻⁴) [Kg m ²]						
			 IEC						
			63	71	80	90	100	112	
F 30 2_6.9	6.9	4.4	—	—	7.3	7.2	8.5	8.5	6.8
F 30 2_9.0	9.0	2.8	—	—	5.6	5.6	6.9	6.9	5.1
F 30 2_12.0	12.0	1.6	3.0	3.0	4.4	4.4	5.7	5.7	3.9
F 30 2_15.1	15.1	1.1	2.5	2.5	3.9	3.9	5.2	5.2	3.4
F 30 2_19.5	19.5	0.7	2.2	2.2	3.6	3.5	4.8	4.8	3.1
F 30 2_24.4	24.4	0.5	1.9	1.9	3.3	3.2	4.5	4.5	2.8
F 30 2_28.9	28.9	0.4	1.8	1.8	3.2	3.2	4.4	4.4	2.7
F 30 2_35.0	35.0	0.3	1.7	1.7	3.1	3.1	4.3	4.3	2.6
F 30 3_40.2	40.2	1.5	—	—	4.3	4.3	5.6	5.6	3.9
F 30 3_52.1	52.1	1.1	—	—	3.9	3.9	5.1	5.1	3.4
F 30 3_69.1	69.1	0.6	2.1	2.1	3.4	3.4	4.7	4.7	2.9
F 30 3_87.4	87.4	0.5	1.9	1.9	3.3	3.3	4.5	4.5	2.8
F 30 3_112.5	112.5	0.3	1.8	1.8	3.2	3.2	4.4	4.4	2.7
F 30 3_140.7	140.7	0.2	1.7	1.7	3.1	3.1	4.3	4.3	2.6
F 30 3_166.8	166.8	0.2	1.7	1.7	3.0	3.0	4.3	4.3	2.6
F 30 3_202.3	202.3	0.1	1.6	1.6	3.0	3.0	4.2	4.2	2.5
F 30 3_253.6	253.6	0.1	1.6	1.6	2.9	2.9	4.2	4.2	2.5
F 30 3_293.8	293.8	0.08	1.6	1.5	2.9	2.9	4.2	4.2	2.4
F 30 3_374.4	374.4	0.05	1.5	1.5	2.9	2.9	4.1	4.1	2.4



F 40

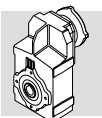
	i	J (· 10 ⁻⁴) [Kg·m ²]									
			 IEC								
			63	71	80	90	100	112	132		
F 40 2_6.7	6.7	11.2	—	—	14.0	14.0	15.3	15.3	30.1		21.7
F 40 2_9.1	9.1	6.4	—	—	9.3	9.2	10.5	10.5	25.3		17.0
F 40 2_11.8	11.8	4.0	—	—	6.9	6.8	8.1	8.1	22.9		14.5
F 40 2_15.1	15.1	2.6	4.1	4.1	5.4	5.4	6.7	6.7	21.5		13.1
F 40 2_18.8	18.8	1.8	3.3	3.2	4.6	4.6	5.9	5.9	20.7		10.9
F 40 2_23.8	23.8	1.1	2.6	2.6	3.9	3.9	5.2	5.2	20.0		10.2
F 40 2_29.9	29.9	0.8	2.2	2.2	3.6	3.5	4.8	4.8	19.7		9.9
F 40 2_35.3	35.3	0.6	2.0	2.0	3.4	3.4	4.7	4.7	—		9.7
F 40 3_37.9	37.9	3.5	—	—	6.4	6.3	7.6	7.6	22.4		14.0
F 40 3_51.5	51.5	2.3	—	—	5.1	5.1	6.4	6.4	21.2		12.8
F 40 3_66.5	66.5	1.5	—	—	4.4	4.3	5.6	5.6	20.4		12.0
F 40 3_84.9	84.9	1.1	2.5	2.5	3.9	3.9	5.2	5.2	20.0		11.6
F 40 3_106.0	106.0	0.8	2.3	2.3	3.7	3.6	5.0	5.0	19.7		9.9
F 40 3_134.4	134.4	0.5	2.0	1.9	3.3	3.3	4.6	4.6	19.4		9.6
F 40 3_168.7	168.7	0.4	1.8	1.8	3.2	3.2	4.5	4.5	19.3		9.5
F 40 3_198.9	198.9	0.3	1.8	1.8	3.1	3.1	4.4	4.4	—		9.4
F 40 3_240.1	240.1	0.2	1.7	1.7	3.1	3.0	4.3	4.3	—		9.3
F 40 3_296.6	296.6	0.1	1.6	1.6	3.0	3.0	4.2	4.2	—		9.3
F 40 3_344.8	344.8	0.1	1.6	1.6	3.0	3.0	4.2	4.2	—		9.2

F 50

	i	J (· 10 ⁻⁴) [Kg·m ²]										
			 IEC									
			63	71	80	90	100	112	132	160	180	
F 50 2_7.2	7.2	22.9	—	—	25.8	25.7	27.0	27.0	41.8	101	99	33
F 50 2_9.1	9.1	15.3	—	—	18.1	18.0	19.3	19.3	34.2	94	91	25.8
F 50 2_12.2	12.2	9.1	—	—	11.9	11.9	13.2	13.2	28.0	87	85	19.6
F 50 2_15.4	15.4	5.9	—	—	8.8	8.7	10.0	10.0	24.8	84	82	16.4
F 50 2_19.5	19.5	3.9	5.4	5.4	6.4	6.7	8.0	8.0	22.8	82	80	14.4
F 50 2_24.0	24.0	2.7	4.2	4.2	5.5	5.5	6.8	6.8	21.6	81	79	11.8
F 50 2_30.7	30.7	1.7	3.2	3.2	4.6	4.5	5.8	5.8	20.6	80	78	10.8
F 50 2_37.5	37.5	1.2	2.7	2.6	4.0	4.0	5.3	5.3	20.1	79	77	10.3
F 50 3_38.9	38.9	6.7	—	—	9.6	9.5	10.1	10.1	25.6	85	83	17.2
F 50 3_48.9	48.9	5.0	—	—	7.8	7.8	9.1	9.1	23.9	83	81	15.5
F 50 3_65.8	65.8	3.4	—	—	6.3	6.2	7.5	7.5	22.3	82	79	13.9
F 50 3_83.2	83.2	2.4	—	—	5.2	5.1	6.4	6.4	21.3	81	78	12.9
F 50 3_105.1	105.1	1.7	3.1	3.1	4.5	4.5	5.8	5.8	20.6	80	78	12.2
F 50 3_129.9	129.9	1.2	2.7	2.7	4.1	4.0	5.3	5.3	20.1	79	77	10.4
F 50 3_165.6	165.6	0.8	2.3	2.3	3.7	3.6	4.9	4.9	19.7	79	77	9.9
F 50 3_202.4	202.4	0.6	2.1	2.0	3.4	3.4	4.7	4.7	19.5	79	76	9.7
F 50 3_239.8	239.8	0.5	1.9	1.9	3.3	3.3	4.5	4.5	—	—	—	9.6
F 50 3_285.9	285.9	0.3	1.8	1.8	3.2	3.1	4.4	4.4	—	—	—	9.5
F 50 3_352.5	352.5	0.2	1.7	1.7	3.1	3.0	4.3	4.3	—	—	—	9.3



	i	J ($\cdot 10^{-4}$) [Kgm ²]										
			 IEC									
			63	71	80	90	100	112	132	160	180	
F 60 3_9.0	9.0	40	—	—	—	—	—	—	59	118	116	61
F 60 3_9.7	9.7	38	—	—	—	—	—	—	57	116	114	59
F 60 3_11.8	11.8	25.0	—	—	27.9	27.8	29.1	29.1	44	103	101	46
F 60 3_12.7	12.7	23.9	—	—	26.8	26.7	28.0	28.1	43	102	100	45
F 60 3_14.5	14.5	17.6	—	—	20.5	20.4	21.7	21.7	37	96	94	39
F 60 3_15.7	15.7	16.9	—	—	19.8	19.7	21.0	21.0	36	95	93	38
F 60 3_19.1	19.1	10.3	—	—	13.2	13.1	14.4	14.4	29.2	89	86	31
F 60 3_20.7	20.7	9.9	—	—	12.8	12.7	14.0	14.0	28.8	88	86	31
F 60 3_23.5	23.5	7.3	—	—	10.2	10.1	11.4	11.4	26.2	86	83	28.3
F 60 3_25.4	25.4	7.1	—	—	9.9	9.9	11.1	11.1	26.0	85	83	28.0
F 60 3_29.6	29.6	15.0	—	—	—	—	—	—	33.9	93	91	36
F 60 3_32.1	32.1	14.8	—	—	—	—	—	—	33.7	93	91	36
F 60 3_38.8	38.8	10.6	—	—	13.5	13.4	14.7	14.7	29.5	89	87	32
F 60 3_42.1	42.1	10.5	—	—	13.4	13.3	14.6	14.6	29.4	89	87	31
F 60 3_47.8	47.8	8.2	—	—	11.0	11.0	12.2	12.2	27.1	86	84	29.1
F 60 3_51.8	51.8	8.1	—	—	10.9	10.9	12.2	12.2	27.0	86	84	29.1
F 60 3_63.0	63.0	4.9	—	—	7.7	7.6	8.9	8.9	23.8	83	81	25.8
F 60 3_68.3	68.3	4.8	—	—	7.7	7.6	8.9	8.9	23.7	83	81	25.8
F 60 3_77.6	77.6	3.7	—	—	6.6	6.5	7.8	7.8	22.6	82	80	24.7
F 60 3_84.0	84.0	3.7	—	—	6.5	6.5	7.8	7.8	22.6	82	80	24.6
F 60 3_98.2	98.2	2.7	4.2	4.2	5.6	5.5	6.8	6.8	21.6	81	79	23.7
F 60 3_106.4	106.4	2.7	4.2	4.2	5.5	5.4	6.8	6.8	21.6	81	79	23.6
F 60 3_120.5	120.5	1.8	3.2	3.2	4.6	4.6	5.9	5.9	20.7	80	78	22.7
F 60 3_130.5	130.5	1.8	3.2	3.2	4.6	4.6	5.8	5.8	20.7	80	78	22.7
F 60 3_150.4	150.4	1.3	2.7	2.7	4.1	4.1	5.4	5.4	20.2	80	77	22.2
F 60 3_162.9	162.9	1.3	2.7	2.7	4.1	4.1	5.4	5.4	20.2	80	77	22.2
F 60 3_185.9	185.9	0.9	2.4	2.4	3.8	3.7	5.0	5.0	19.9	79	77	21.9
F 60 3_201.4	201.4	0.9	2.4	2.4	3.8	3.7	5.0	5.0	19.8	79	77	21.9
F 60 3_217.6	217.6	0.7	2.2	2.2	3.6	3.5	4.8	4.8	—	—	—	21.7
F 60 3_235.8	235.8	0.7	2.2	2.2	3.6	3.5	4.8	4.8	—	—	—	21.7
F 60 3_259.1	259.1	0.5	2.0	2.0	3.4	3.3	4.6	4.6	—	—	—	21.5
F 60 3_280.7	280.7	0.5	2.0	2.0	3.4	3.3	4.6	4.6	—	—	—	21.5

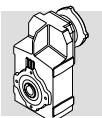


F 70

	i	J ($\cdot 10^{-4}$) [Kgm ²]									
			 IEC								
			80	90	100	112	132	160	180	200	
F 70 3_10.0	10.0	—	—	—	—	—	—	169	167	176	133
F 70 3_10.9	10.9	—	—	—	—	—	—	166	163	173	129
F 70 3_12.8	12.8	—	—	—	—	—	—	139	137	146	102
F 70 3_13.9	13.9	—	—	—	—	—	—	137	135	144	100
F 70 3_16.3	16.3	39	—	—	—	—	58	117	115	124	80
F 70 3_17.7	17.7	37	—	—	—	—	56	116	113	123	79
F 70 3_20.9	20.9	26	—	—	—	—	45	105	102	—	68
F 70 3_22.6	22.6	26	—	—	—	—	44	104	102	—	67
F 70 3_24.6	24.6	21	—	—	—	—	40	99	97	—	62
F 70 3_27.7	27.7	—	—	—	—	—	—	128	126	135	73
F 70 3_30.0	30.0	—	—	—	—	—	—	127	125	134	73
F 70 3_35.4	35.4	—	—	—	—	—	—	114	112	121	77
F 70 3_38.4	38.4	—	—	—	—	—	—	114	111	121	77
F 70 3_45.2	45.2	23.3	—	—	—	—	42	101	99	108	65
F 70 3_49.0	49.0	23.1	—	—	—	—	42	101	99	108	65
F 70 3_57.7	57.7	16.9	—	—	—	—	36	95	93	—	58
F 70 3_62.5	62.5	16.8	—	—	—	—	36	95	93	—	58
F 70 3_67.9	67.9	14.0	—	—	—	—	33	92	90	—	55
F 70 3_73.6	73.6	13.9	—	—	—	—	33	92	90	—	55
F 70 3_85.4	85.4	9.0	11.4	11.4	12.7	12.7	27.9	87	85	—	50
F 70 3_92.5	92.5	9.0	11.4	11.3	12.6	12.6	27.9	87	85	—	50
F 70 3_101.2	101.2	6.3	8.9	8.8	10.1	10.1	25.2	85	82	—	47
F 70 3_109.6	109.6	6.3	8.9	8.8	10.1	10.1	25.2	85	82	—	47
F 70 3_122.7	122.7	5.1	7.9	7.8	9.1	9.1	24.0	83	81	—	46
F 70 3_133.0	133.0	5.1	7.9	7.8	9.1	9.1	24.0	83	81	—	46
F 70 3_153.8	153.8	3.2	6.0	6.0	7.3	7.3	22.1	81	79	—	44
F 70 3_166.7	166.7	3.2	6.0	6.0	7.3	7.3	22.1	81	79	—	44
F 70 3_180.9	180.9	2.3	5.1	5.1	6.3	6.3	21.2	81	78	—	43
F 70 3_196.0	196.0	2.3	5.1	5.0	6.3	6.3	21.2	81	78	—	43

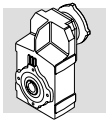


	i	J (· 10 ⁻⁴) [Kgm ²]										
			 IEC									
			80	90	100	112	132	160	180	200	225	
F 80 3_10.3	10.3	—	—	—	—	—	—	—	286	300	578	252
F 80 3_11.2	11.2	—	—	—	—	—	—	—	277	291	569	244
F 80 3_12.9	12.9	—	—	—	—	—	—	217	218	231	509	184
F 80 3_14.0	14.0	—	—	—	—	—	—	212	212	226	504	178
F 80 3_16.2	16.2	—	—	—	—	—	—	173	171	180	464	136
F 80 3_17.6	17.6	—	—	—	—	—	—	170	167	177	461	133
F 80 3_20.3	20.3	60	—	—	—	—	79	139	136	146	431	102
F 80 3_22.0	22.0	58	—	—	—	—	77	136	134	143	429	100
F 80 3_25.2	25.2	43	—	—	—	—	62	121	119	150	413	84
F 80 3_28.8	28.8	—	—	—	—	—	—	—	189	203	480	155
F 80 3_31.3	31.3	—	—	—	—	—	—	—	188	201	479	154
F 80 3_36.0	36.0	—	—	—	—	—	—	155	155	169	447	121
F 80 3_39.0	39.0	—	—	—	—	—	—	154	154	168	446	121
F 80 3_45.3	45.3	—	—	—	—	—	—	133	132	141	425	97
F 80 3_49.1	49.1	—	—	—	—	—	—	133	131	140	425	97
F 80 3_56.7	56.7	35	—	—	—	—	54	113	111	120	406	77
F 80 3_61.5	61.5	35	—	—	—	—	54	113	111	120	406	76
F 80 3_70.4	70.4	26.7	—	—	—	—	46	105	103	133	397	68
F 80 3_76.3	76.3	26.5	—	—	—	—	45	105	103	133	396	68
F 80 3_85.2	85.2	20.4	—	—	—	—	39	99	96	126	389	62
F 80 3_92.3	92.3	20.3	—	—	—	—	39	99	96	126	389	61
F 80 3_105.0	105.0	13.6	16.0	15.9	17.2	17.2	32	92	90	119	383	55
F 80 3_113.8	113.8	13.5	15.9	15.9	17.1	17.1	32	92	90	119	382	55
F 80 3_122.5	122.5	12.6	15.2	15.2	16.5	16.5	32	91	89	118	381	54
F 80 3_132.7	132.7	12.6	15.2	15.1	16.4	16.4	31	91	89	118	381	54
F 80 3_147.9	147.9	8.5	11.3	11.2	12.5	12.5	27.4	87	85	114	377	50
F 80 3_160.2	160.2	8.5	11.2	11.1	12.5	12.5	27.4	87	84	—	—	50
F 80 3_184.6	184.6	5.1	7.9	7.8	9.1	9.1	24.0	83	81	—	—	46
F 80 3_200.0	200.0	5.0	7.9	7.8	9.1	9.1	23.9	83	81	—	—	46



F 90

	i	J (· 10 ⁻⁴) [Kgm ²]											
			 IEC										
			80	90	100	112	132	160	180	200	225	250	
F 90 3_10.3	10.3	—	—	—	—	—	—	—	—	—	843	870	510
F 90 3_11.1	11.1	—	—	—	—	—	—	—	—	—	823	850	489
F 90 3_13.4	13.4	—	—	—	—	—	—	—	—	—	667	694	333
F 90 3_14.5	14.5	—	—	—	—	—	—	—	—	—	655	682	321
F 90 3_16.5	16.5	—	—	—	—	—	—	—	—	—	580	607	246
F 90 3_17.9	17.9	—	—	—	—	—	—	—	—	—	572	599	238
F 90 3_20.6	20.6	—	—	—	—	—	—	224	222	232	516	542	184
F 90 3_22.3	22.3	—	—	—	—	—	—	220	217	227	511	537	179
F 90 3_25.4	25.4	103	—	—	—	—	122	181	179	188	474	500	142
F 90 3_28.6	28.6	—	—	—	—	—	—	—	—	—	585	613	252
F 90 3_31.0	31.0	—	—	—	—	—	—	—	—	—	583	610	250
F 90 3_37.4	37.4	—	—	—	—	—	—	—	—	—	516	543	182
F 90 3_40.5	40.5	—	—	—	—	—	—	—	—	—	514	541	181
F 90 3_46.1	46.1	—	—	—	—	—	—	—	—	—	480	507	147
F 90 3_49.9	49.9	—	—	—	—	—	—	—	—	—	479	506	146
F 90 3_57.3	57.3	73	—	—	—	—	—	161	158	168	452	479	120
F 90 3_62.1	62.1	72	—	—	—	—	—	160	158	167	451	478	120
F 90 3_70.8	70.8	61	—	—	—	—	80	139	137	146	432	458	100
F 90 3_76.7	76.7	60	—	—	—	—	79	139	136	146	431	458	100
F 90 3_88.4	88.4	44	—	—	—	—	63	123	120	151	414	441	83
F 90 3_95.8	95.8	44	—	—	—	—	63	122	120	151	414	441	83
F 90 3_103.3	103.3	41	—	—	—	—	59	119	117	146	410	436	78
F 90 3_111.9	111.9	40	—	—	—	—	59	119	116	146	409	436	78
F 90 3_126.8	126.8	26	29	29	30	30	45	105	102	132	395	422	64
F 90 3_137.3	137.3	26	29	29	30	30	45	104	102	132	395	422	64
F 90 3_150.3	150.3	21	24	24	25	25	40	100	97	127	390	417	59
F 90 3_162.8	162.8	21	24	24	25	25	40	100	97	127	390	417	59
F 90 3_179.2	179.2	14	16	16	18	18	33	92	90	—	—	—	51
F 90 3_194.2	194.2	14	16	16	17	17	33	92	90	—	—	—	51

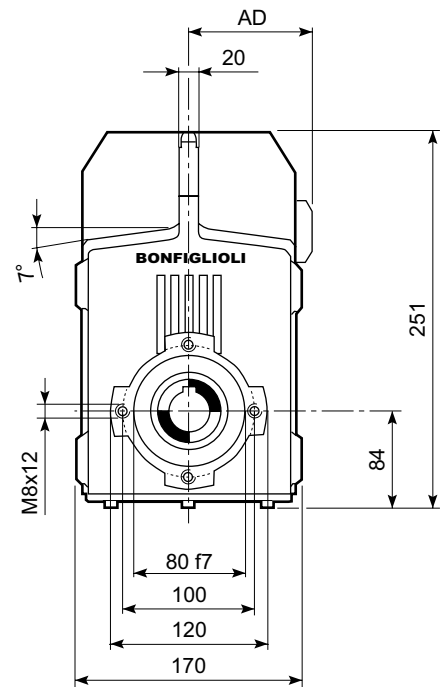
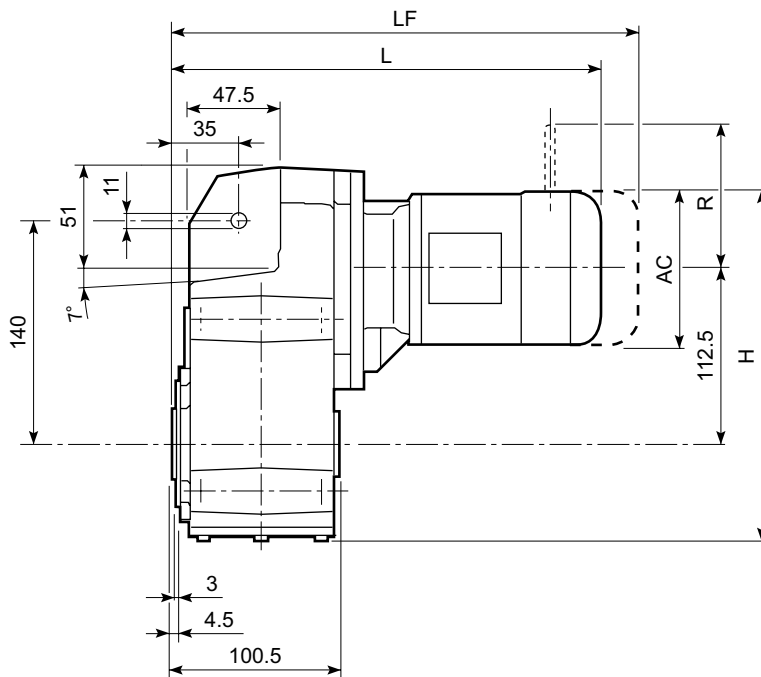


30 - DIMENSIONI

30 - DIMENSIONS

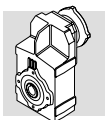
30 - ABMESSUNGEN

30 - DIMENSIONS

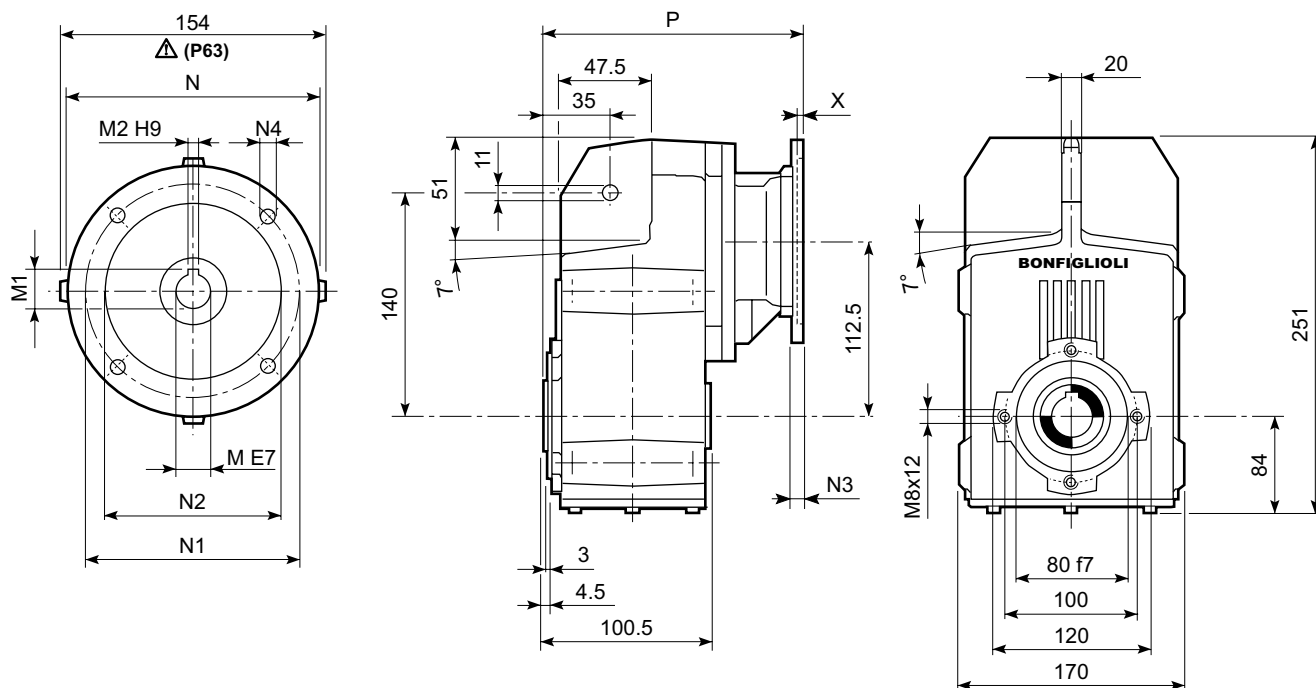


F 10

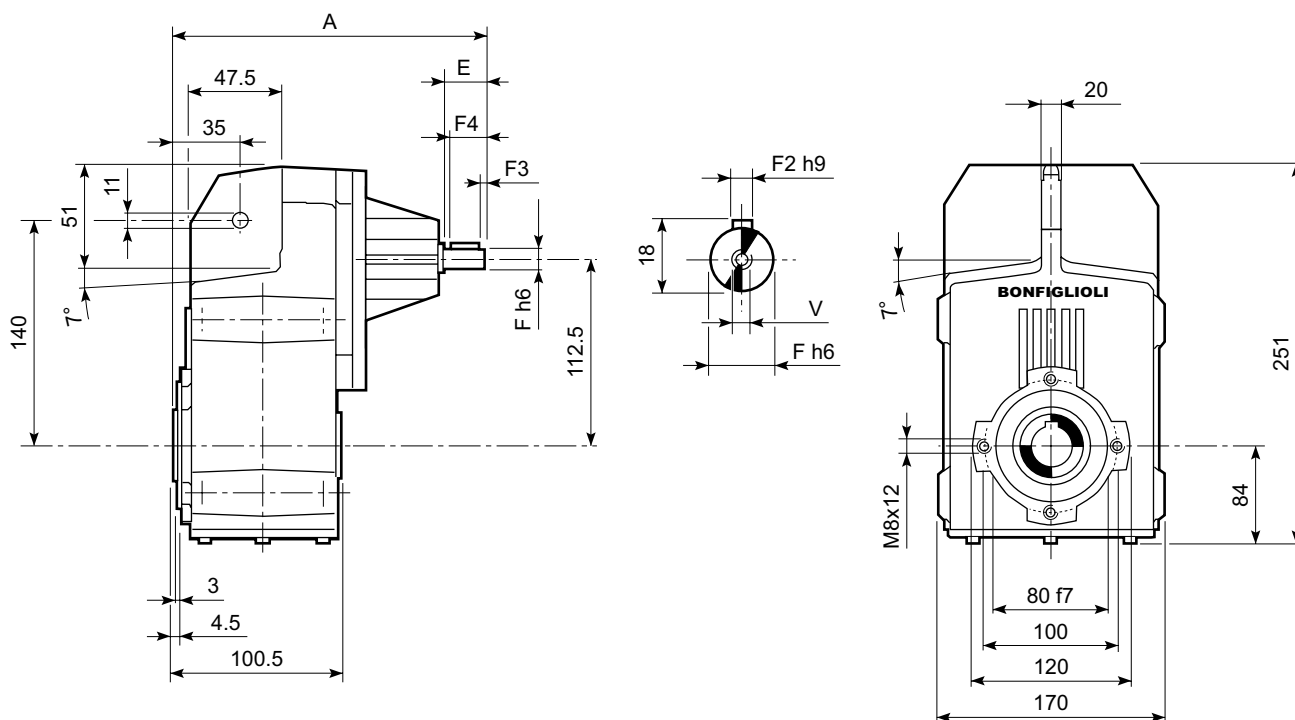
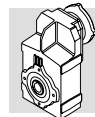
									M_FD M_FA		M_FD		M_FA	
			AC	H	L	AD		LF		R	AD	R	AD	
F 10 2	S05	M05	121	220.5	311.5	95	12	377.5	13	96	119	116	95	
F 10 2	S1	M1S	138	265.5	316.5	108	12	379.5	15	103	132	124	108	
F 10 2	S1	M1L	138	265.5	340.5	108	14	401.5	17	103	132	124	108	
F 10 2	S2	M2S	156	274.5	369.5	119	18	439.5	21	129	143	134	119	
F 10 2	S3	M3S	195	294	412.5	142	22	508.5	30	160	155	160	142	
F 10 2	S3	M3L	195	294	444.5	142	24	535.5	31	160	155	160	142	



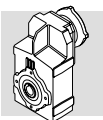
F 10...P(IEC)



F 10												
		M	M1	M2	N	N1	N2	N3	N4	X	P	kg
F 10 2	P63	11	12.8	4	140	115	95	—	M8x19	4	185.5	8
F 10 2	P71	14	16.3	5	160	130	110	—	M8x16	4.5	185.5	8
F 10 2	P80	19	21.8	6	200	165	130	—	M10x12	4	205	9
F 10 2	P90	24	27.3	8	200	165	130	—	M10x12	4	205	9
F 10 2	P100	28	31.3	8	250	215	180	—	M12x16	4.5	215	13
F 10 2	P112	28	31.3	8	250	215	180	—	M12x16	4.5	215	13

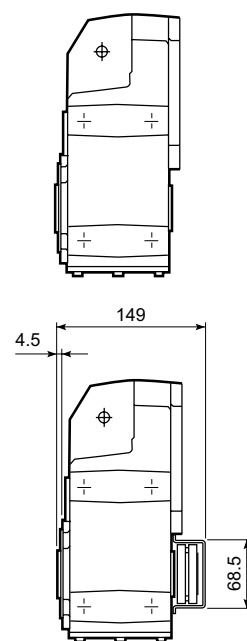
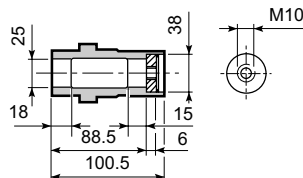
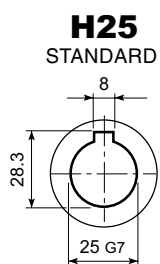


F 10										
		A	E	F	F1	F2	F3	F4	V	 Kg
F 10 2	HS	192	40	16	18	5	2.5	35	M6x16	7.5

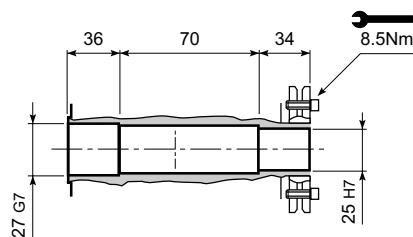


F 10

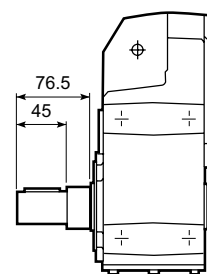
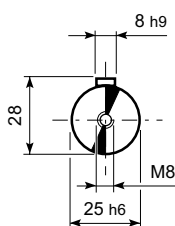
F 10...H



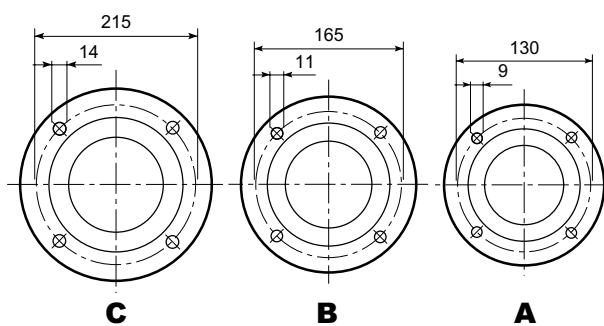
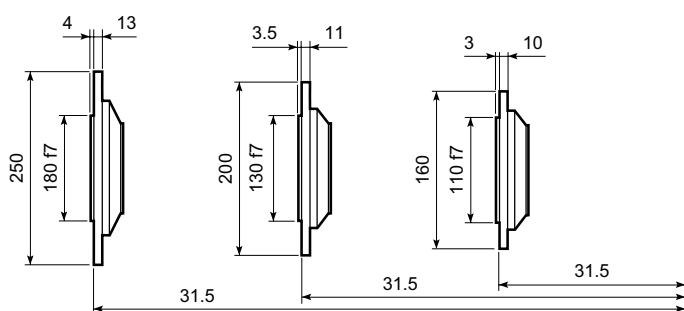
F 10...S

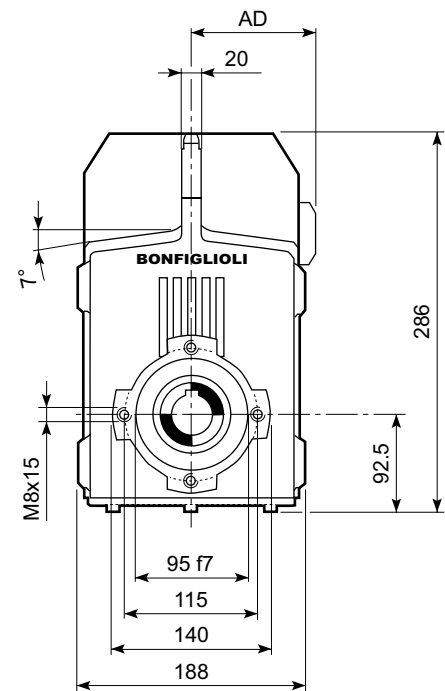
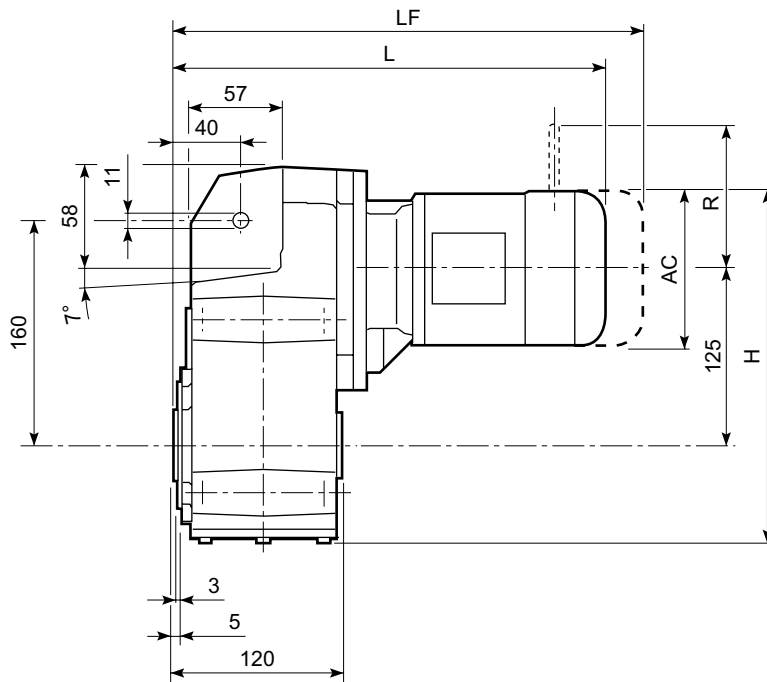
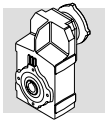


F 10...R

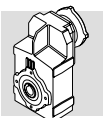


F 10...F...

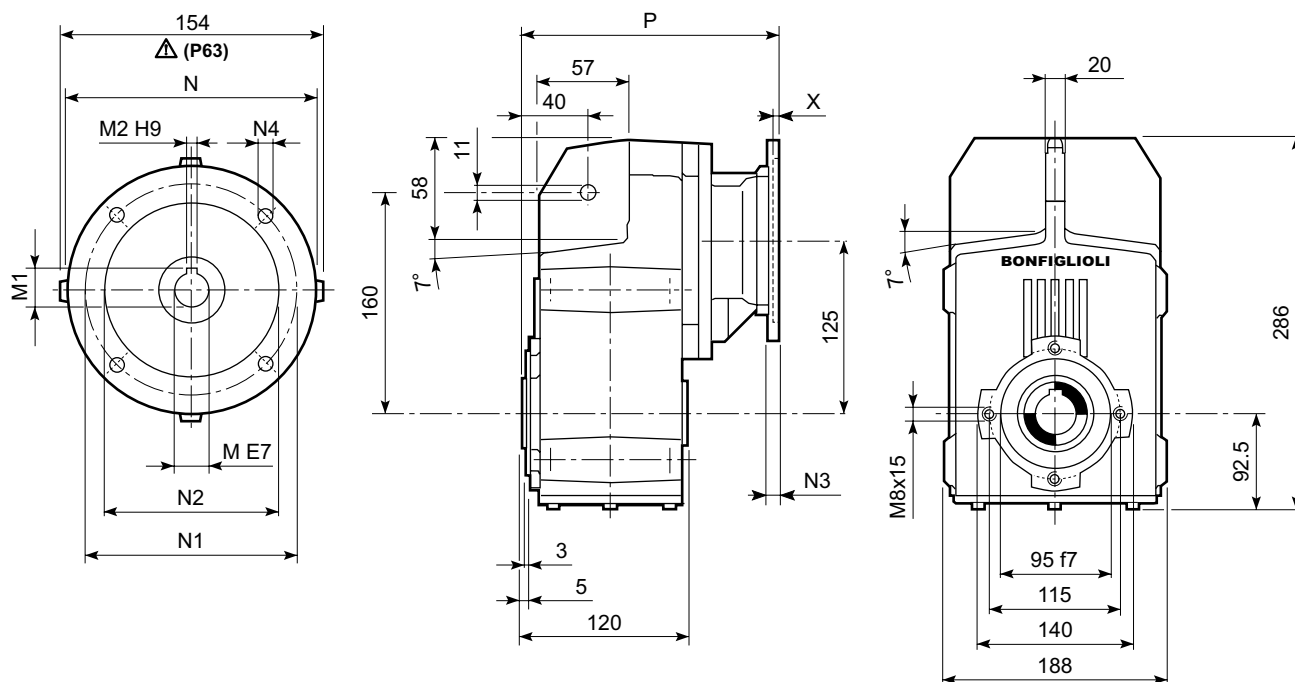




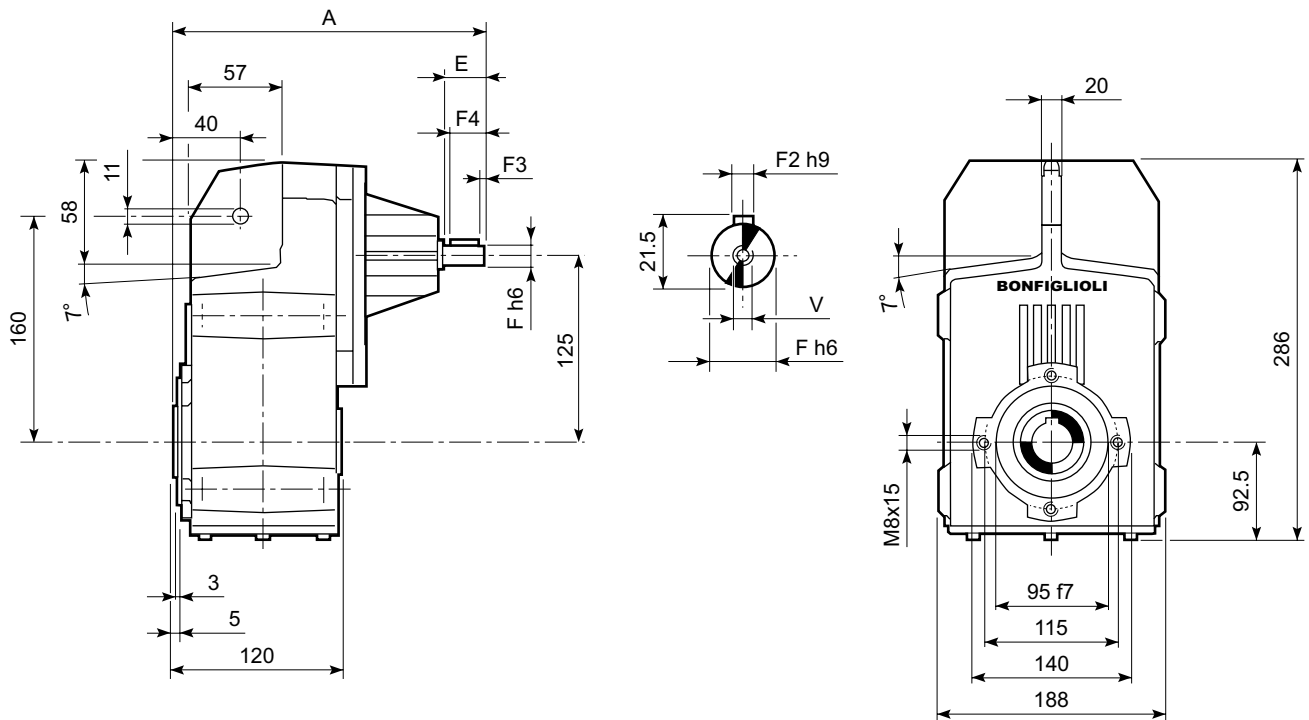
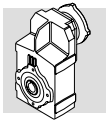
F 20													
								M_FD M_FA		M_FD		M_FA	
			AC	H	L	AD	Kg	LF	Kg	R	AD	R	AD
F 20 2	S05	M05	121	278.2	323.5	95	15	389.5	17	96	119	116	95
F 20 2	S1	M1S	138	286.7	328.5	108	16	391.5	19	103	132	124	108
F 20 2	S1	M1L	138	286.7	352.5	108	17	413.5	20	103	132	124	108
F 20 2	S2	M2S	156	295.7	381.5	119	21	451.5	25	129	143	134	119
F 20 2	S3	M3S	195	315.2	424.5	142	26	520.5	33	160	155	160	142
F 20 2	S3	M3L	195	315.2	456.5	142	31	547.5	38	160	155	160	142
F 20 3	S05	M05	121	278.2	379	95	17	445	18	96	119	116	95
F 20 3	S1	M1S	138	286.7	384	108	18	447	20	103	132	124	108
F 20 3	S1	M1L	138	286.7	408	108	19	469	21	103	132	124	108
F 20 3	S2	M2S	156	295.7	437	119	22	507	26	129	143	134	119
F 20 3	S3	M3S	195	315.2	480	142	27	576	34	160	155	160	142
F 20 3	S3	M3L	195	315.2	512	142	32	603	39	160	155	160	142



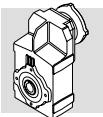
F 20...P(IEC)



F 20												
		M	M1	M2	N	N1	N2	N3	N4	X	P	Kg
F 20 2	P63	11	12.8	4	140	115	95	—	M8x19	4	197.5	12
F 20 2	P71	14	16.3	5	160	130	110	—	M8x16	4.5	197.5	12
F 20 2	P80	19	21.8	6	200	165	130	—	M10x12	4	217	13
F 20 2	P90	24	27.3	8	200	165	130	—	M10x12	4	217	12
F 20 2	P100	28	31.3	8	250	215	180	—	M12x16	4.5	227	16
F 20 2	P112	28	31.3	8	250	215	180	—	M12x16	4.5	227	16
F 20 3	P63	11	12.8	4	140	115	95	—	M8x19	4	253	13
F 20 3	P71	14	16.3	5	160	130	110	—	M8x16	4.5	253	13
F 20 3	P80	19	21.8	6	200	165	130	—	M10x12	4	272.5	14
F 20 3	P90	24	27.3	8	200	165	130	—	M10x12	4	272.5	14
F 20 3	P100	28	31.3	8	250	215	180	—	M12x16	4.5	282.5	18
F 20 3	P112	28	31.3	8	250	215	180	—	M12x16	4.5	282.5	18

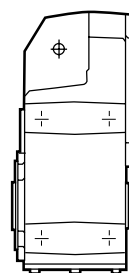
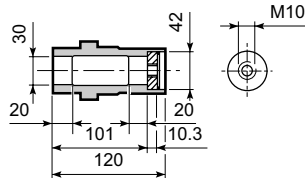
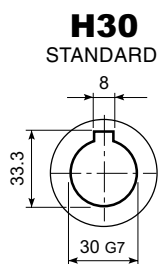


F 20										
		A	E	F	F1	F2	F3	F4	V	kg
F 20 2	HS	247.5	40	19	21.5	6	2.5	35	M6x16	11.5
F 20 3		260	40	16	18	5	2.5	35	M6x16	12.4

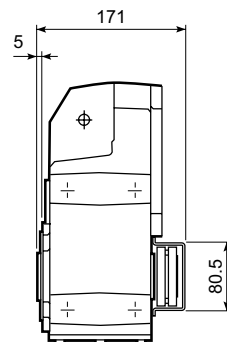
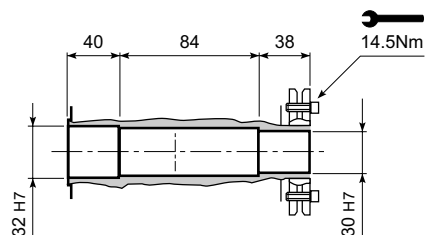


F 20

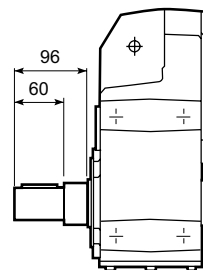
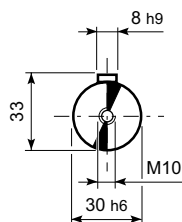
F 20...H



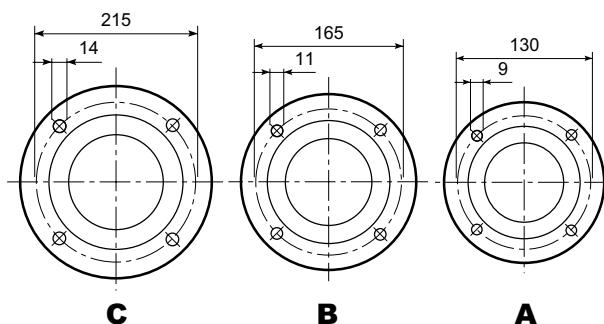
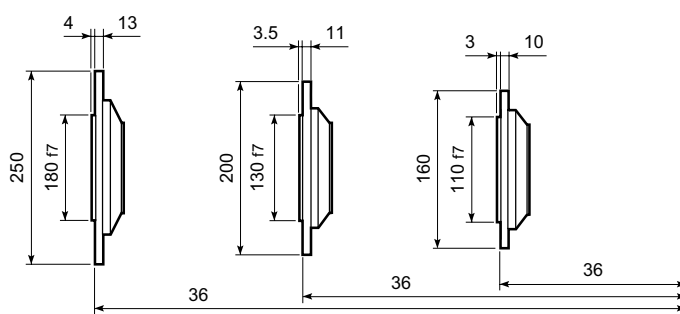
F 20...S

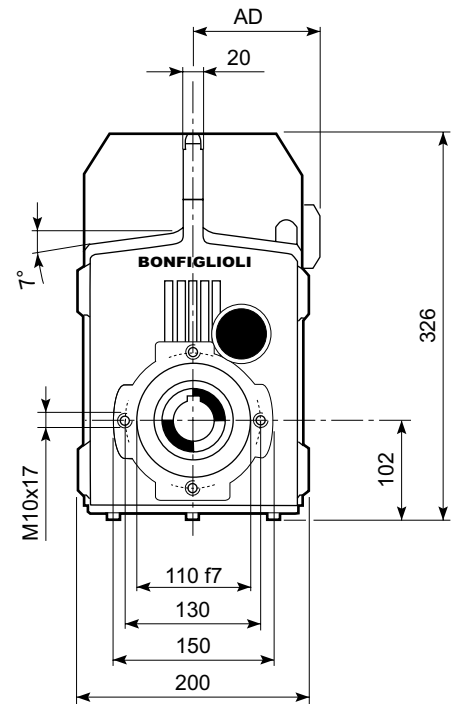
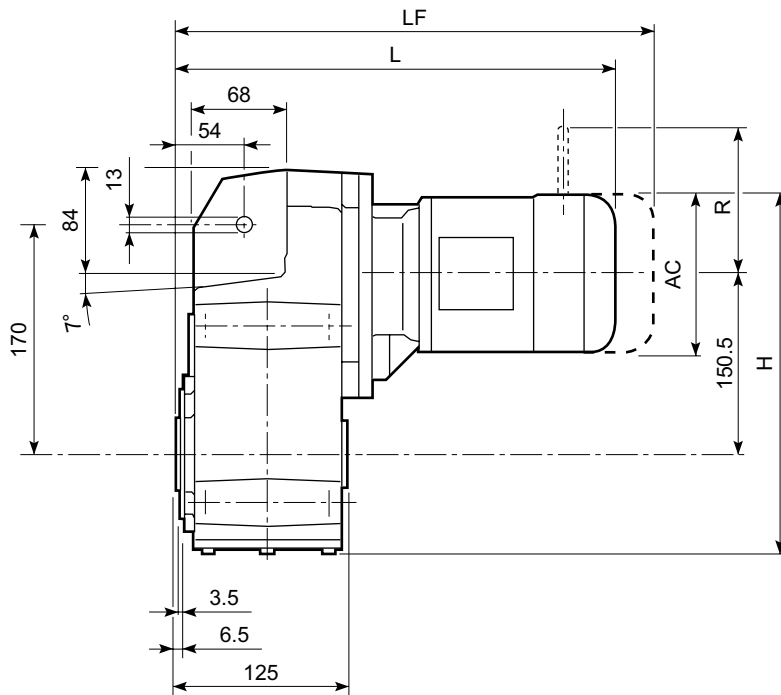
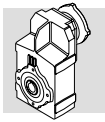


F 20...R



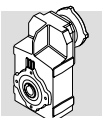
F 20...F...



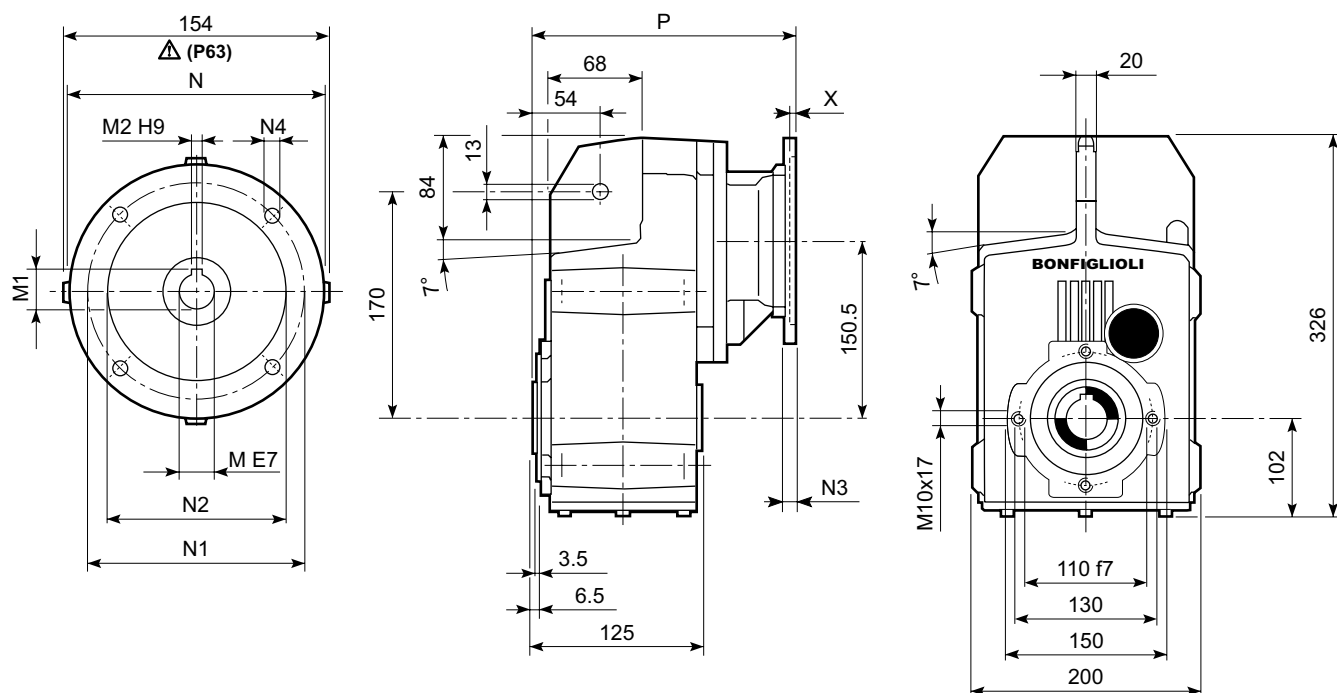


F 30

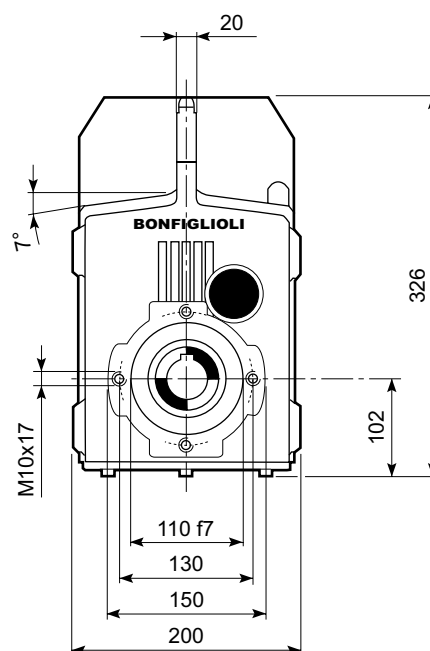
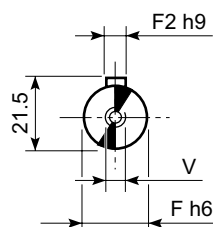
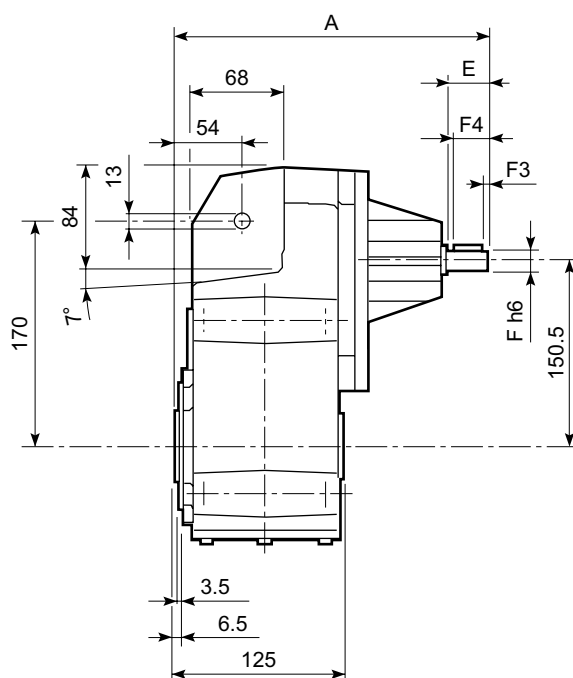
F 30													
								M_FD M_FA		M_FD		M_FA	
			AC	H	L	AD		LF		R	AD	R	AD
F 30 2/3	S1	M1S	138	321.3	356.5	108	21	419.5	23	103	132	124	108
F 30 2/3	S1	M1L	138	321.3	380.5	108	22	441.5	25	103	132	124	108
F 30 2/3	S2	M2S	156	330.3	409.5	119	26	479.5	30	129	143	134	119
F 30 2/3	S3	M3S	195	349.8	452.5	142	31	548.5	38	160	155	160	142
F 30 2/3	S3	M3L	195	349.8	484.5	142	38	575.5	45	160	155	160	142
F 30 4	S05	M05	121	312.8	409	95	20	475	22	96	119	116	95
F 30 4	S1	M1S	138	321.3	414	108	21	477	24	103	132	124	108
F 30 4	S1	M1L	138	321.3	438	108	22	499	25	103	132	124	108
F 30 4	S2	M2S	156	330.3	467	119	26	537	31	129	143	134	119
F 30 4	S3	M3S	195	349.8	510	142	31	606	39	160	155	160	142
F 30 4	S3	M3L	195	349.8	542	142	38	633	46	160	155	160	142



F 30...P(IEC)

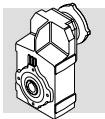


F 30												
		M	M1	M2	N	N1	N2	N3	N4	X	P	Kg
F 30 2/3	P63	11	12.8	4	140	115	95	—	M8x19	4	225.5	17
F 30 2/3	P71	14	16.3	5	160	130	110	—	M8x16	4.5	225.5	17
F 30 2/3	P80	19	21.8	6	200	165	130	—	M10x12	4	245	18
F 30 2/3	P90	24	27.3	8	200	165	130	—	M10x12	4	245	17
F 30 2/3	P100	28	31.3	8	250	215	180	—	M12x16	4.5	255	21
F 30 2/3	P112	28	31.3	8	250	215	180	—	M12x16	4.5	255	21
F 30 4	P63	11	12.8	4	140	115	95	—	M8x19	4	283	17
F 30 4	P71	14	16.3	5	160	130	110	—	M8x16	4.5	283	17
F 30 4	P80	19	21.8	6	200	165	130	—	M10x12	4	302.5	18
F 30 4	P90	24	27.3	8	200	165	130	—	M10x12	4	302.5	18
F 30 4	P100	28	31.3	8	250	215	180	—	M12x16	4.5	312.5	22
F 30 4	P112	28	31.3	8	250	215	180	—	M12x16	4.5	312.5	22



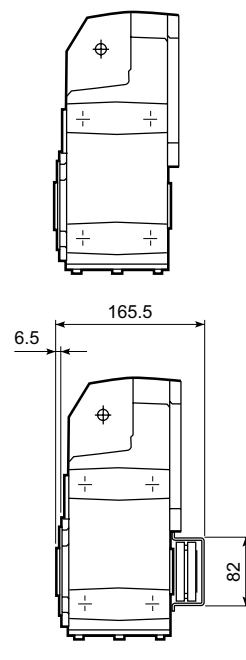
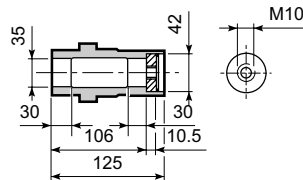
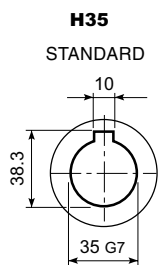
F 30

										 Kg
		A	E	F	F1	F2	F3	F4	V	
F 30 2	HS	275.5	40	19	21.5	6	2.5	35	M6x16	16.7
F 30 3		275.5	40	19	21.5	6	2.5	35	M6x16	16.7
F 30 4		290	40	16	18	5	2.5	35	M6x16	16.5

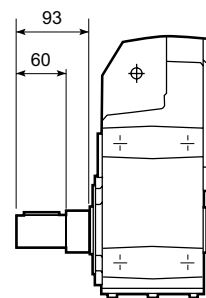
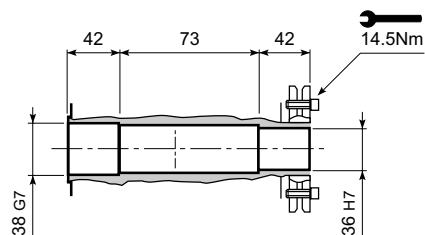


F 30

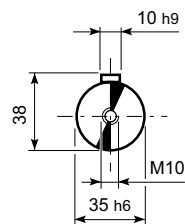
F 30...H



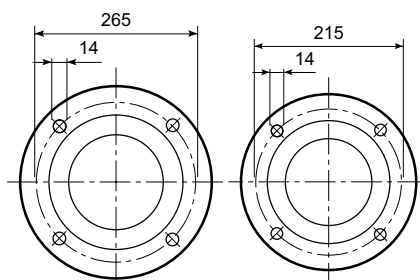
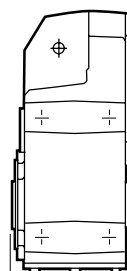
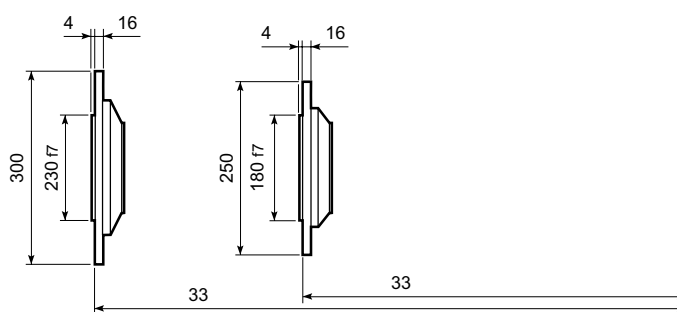
F 30...S



F 30...R

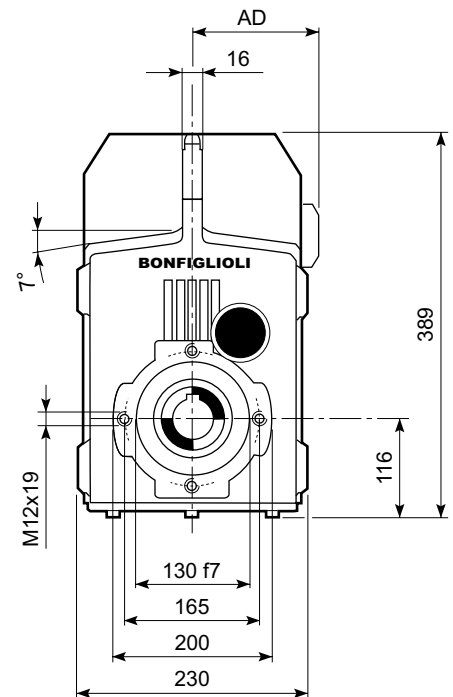
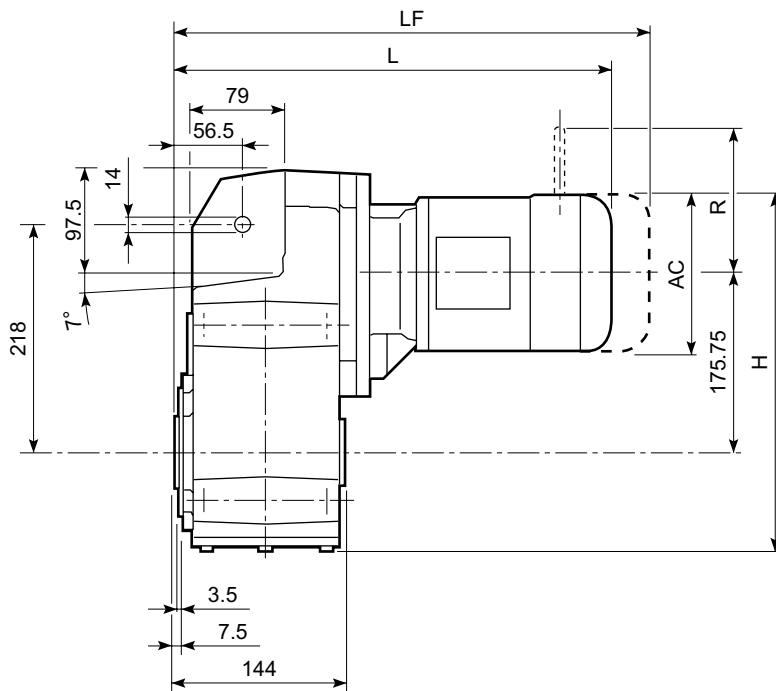
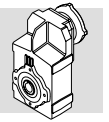


F 30...F...

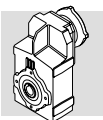


B

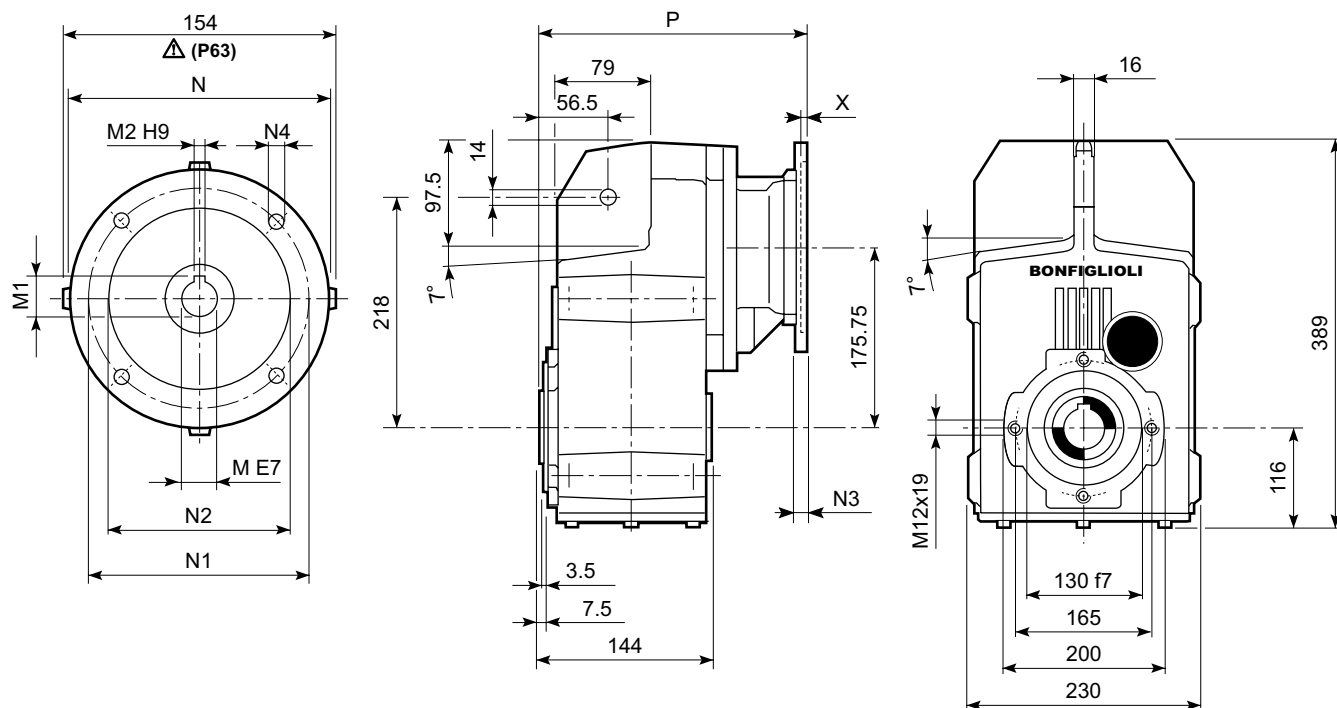
A



F 40													
								M_FD M_FA		M_FD		M_FA	
			AC	H	L	AD	 Kg	LF	 Kg	R	AD	R	AD
F 40 2/3	S1	M1S	138	360.8	377	108	44	440	47	103	132	124	108
F 40 2/3	S1	M1L	138	360.8	401	108	46	462	48	103	132	124	108
F 40 2/3	S2	M2S	156	369.8	430	119	49	500	53	129	143	134	119
F 40 2/3	S3	M3S	195	389.3	473	142	54	569	62	160	155	160	142
F 40 2/3	S3	M3L	195	389.3	505	142	62	596	69	160	155	160	142
F 40 2/3	S4	M4S	258	420.8	575	193	81	684	95	226	193	217	193
F 40 2/3	S4	M4L	258	420.8	613	193	96	722	114	226	193	217	193
F 40 2/3	S4	M4LC	258	420.8	648	193	104	747	122	226	193	217	193
F 40 4	S05	M05	231	352.3	433.5	95	45	499.5	46	96	119	116	95
F 40 4	S1	M1S	138	360.8	438.5	108	45	501.5	48	103	132	124	108
F 40 4	S1	M1L	138	360.8	462.5	108	47	523.5	49	103	132	124	108
F 40 4	S2	M2S	156	369.8	491.5	119	50	561.5	58	129	143	134	119
F 40 4	S3	M3S	195	389.3	534.5	142	55	630.5	62	160	155	160	142
F 40 4	S3	M3L	195	389.3	566.5	142	63	657.5	70	160	155	160	142



F 40...P(IEC)



F 40												
		M	M1	M2	N	N1	N2	N3	N4	X	P	kg
F 40 2/3	P63	11	12.8	4	140	115	95	—	M8x19	4	246	42
F 40 2/3	P71	14	16.3	5	160	130	110	—	M8x16	4.5	246	42
F 40 2/3	P80	19	21.8	6	200	165	130	—	M10x12	4	265.5	43
F 40 2/3	P90	24	27.3	8	200	165	130	—	M10x12	4	265.5	43
F 40 2/3	P100	28	31.3	8	250	215	180	—	M12x16	4.5	275.5	47
F 40 2/3	P112	28	31.3	8	250	215	180	—	M12x16	4.5	275.5	47
F 40 2/3	P132	38	41.3	10	300	265	230	16	14	5	312	50
F 40 4	P63	11	12.8	4	140	115	95	—	M8x19	4	307.5	44
F 40 4	P71	14	16.3	5	160	130	110	—	M8x16	4.5	307.5	44
F 40 4	P80	19	21.8	6	200	165	130	—	M10x12	4	327	45
F 40 4	P90	24	27.3	8	200	165	130	—	M10x12	4	327	45
F 40 4	P100	28	31.3	8	250	215	180	—	M12x16	4.5	337	49
F 40 4	P112	28	31.3	8	250	215	180	—	M12x16	4.5	337	49